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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Extract from *Miscellanea Curiosa*, published in 1707.

CLAYTON'S LETTERS FROM VIRGINIA IN 1688.

Addressed to the Royal Society.

(Continued from Farmers' Register, p. 584.)

Being honour'd with the thanks of the Society for my last, and receiving by my worthy friend, Dr. *Moulin*, their commands to proceed, I have added here my observations of the waters, and part of the earth and soil. I shall waive both complements and apologies, since I have greater respect and honor for the Society than I can possibly express, and have no reason to suspect their favour, whose candidness I so signally proved in my last.

Of the Water.

'Twixt the two capes, the southern, call'd the *Cape Henry*, the more northerly call'd *Cape Charles*, there runs up a great bay, call'd the bay of *Cheesepeak;* nine leagues over in some places, in most, seven, lying much west, nore and south, dividing *Virginia* into two unequal parts. On the east side of this bay, there lies a narrow neck of land, which makes the counties of *Northampton* and *Accomack*. On the west side of the bay, there branches forth four great rivers, *James River*, *York River*, *Rapahanack* and *Potomack*, that rise from a ridge of mountains, whereof more in the sequel. These rivers plentifully water all the other parts of *Virginia*, emptying themselves into the great bay. The mouth of *James River*, which is the most southerly of them, the mouth of *Potomack*, which is the most northerly, may be a hundred miles distance: but as I have been credibly inform'd, that the falls of *James River*, are not past thirty miles from *Potomack*, which is a vast large river, nine miles over, in many places. I have been told it was navigable nigh two hundred miles, much higher than any of the other rivers: whence I conclude in future times, it will be the most considerable for trade, when the country comes to be inhabited further up into the main land. The other rivers are much about three miles over, a piece. And *James River* is navigable, at least eighty miles. Within four or five miles of *James Town*, *James River* and *York River* are not past four or five miles asunder. Yea, sloops of considerable carriage may sail up the branches of the two rivers, till they come within a mile, the one of the other; for I take it to be no more from Col. *Bollard's* to Major *Troop's* landing, and I believe they may come much what as near again at Col. *Coles*,' and several places. *York* River, is distant from *Rapahanack*, in some places, not past ten or twelve miles; *Rapahanack* from *Potomack*, not past seven miles in one place, tho' it may be sixty in others. The heads of the branches of the rivers interfere and lock one within another, which I think is best expressed after the manner, that an *Indian* explained himself once to me, when I enquired how nigh the rivers of *Carolina*, *Virginia* and *Maryland*, arose out of the mountains, from those that ran westerly on the other side of the mountains, he clapt the fingers of one hand 'twixt those of the other, crying, they meet thus; the branches of different rivers rising not past a hundred paces distant one from another: so that no country in the world, can be more curiously watered. But this conveniency, that in future times may make her like the *Netherlands*, the richest place in all *America*. at the present, I look on as the greatest impediment to the advance of the country, as it is the greatest obstacle to trade and commerce. For the great number of rivers, and the thinness of the inhabitants, distract and disperse a trade. So that all ships in general, gather each their loading up and down an hundred miles distant; and the best of trade that can be driven, is only a sort of *Scotch* pedling; for they must carry all sort of truck that trade thither, having one commodity to pass off another. This, (*i. e.* the number of rivers,) is one of the chief reasons why they have no towns; for every one being more solicitous for a private interest and conveniency, than for a publick, they will either be for making forty towns at once, that is, two in every county, or none at all, which is the country's ruin. But to return: the tides in these rivers regularly ebb and flow about two foot perpendicular at *James Town;* there is there, as they call it, a tide and half tide, that is, it flows near two hours along by the shoar, after that, it is ebb in the channel, and again it ebbs near two hours by the shoar, after that, it is flood in the channel. This is great advantage to the boats passing up and down the river. I suppose this is caused by many creeks and branches of the rivers, which being considerable many, tho' only three or four miles long, yet as broad as the *Thames* at *London;* others ten miles long, some above twenty, that have little fresh water which they carry of their own, but their current primarily depending upon the flux and re-flux of the sea. So that after the tide is made in the channel, it flows by the shoar a considerable time afterwards, being that those creeks are still to fill, and therefore, as it were draws up a source upwards by the shoar; and likewise, when the tide returns in the channel, the creeks that would not so readily disburse their water, being still to empty themselves, they make an ebbing by the shoar a considerable time after that it is flood, as I say, in the channel. So far as the salt waters reach the country, is deemed less healthy. In the freshes, they more rarely are troubled with the seasonings, and those endemical distempers about *September* and *October*. This being very remarkable, I refer the reason to the more piercing genius of those most judicious members of the Society: and it might, perhaps, be worthy the disquisition of the most learned, to give an account of the various alterations and fatal effects that the air has on humane bodies, especially when impregnated with a marine salt; more peculiarly, when such an air becomes stagnant: this might, perhaps, make several beneficial discoveries, not only in relation to those distempers in *America*, but, perhaps, take in your *Kentish* agues, and many others remarkable enough in our own nation. I lately was making some observations of this nature, on a lady of a delicate con-

stitution, who living in a clear air, and removing towards the sea-coast, was lamentably afflicted therewith, which both myself and others attributed to this cause, she having formerly upon her going to the same, been seized in the same manner. But to return. There is one thing more in reference to this very thing, very remarkable in *Virginia;* generally twice in the year, spring and fall, at certain spring-tides, the most of the cattle will set on gadding, and run, tho' it be twenty or thirty miles, to the river to drink the salt water, at which time there's scarce any stopping of them; which the people know so well, that if about those times their heards are stray'd from their plantations, without more solicitation, they go directly to the rivers to fetch them home again. As for the waters in the springs in general, they are, I think, somewhat more eager than those in *England.* In that, I have observed, they require some quantity more of malt to make strong beer, than our *English* waters, and will not bear soap. I have try'd several by infusing of galls, and found little difference in the colours, turning much what the colour of common sack in taverns. I tried two wells at Col. *Bird's*, by the falls of *James River*, several wells near *James Town*, some springs in the *Isle of Wight County.* There's a spring in the *Isle of Wight*, or *Nansamond County*, vents the greatest source of water I ever saw, excepting *Holy-well* in *Wales*, but I had not opportunity to make experiments thereof. I tried likewise some springs on the banks of *York River*, in *New Kent* and *Gloucester County*, but found them vary very little as to colour. I could not try any thing as to their specifick gravity, having neither aquapoise, nor those other glasses I had contrived peculiarly for making such experiments, they being all lost with my other things. I had glasses blown would hold about five ounces, others about ten ounces, with necks so small, that a drop would make a considerable variation; with these I could make much more critical and satisfactory observations as to the specifical gravity of liquors, having critical scales, than by any other way yet by me tried. I used this method to weigh urines, which practice I would recommend to the inquisitive and critical physicians. I had made many observations hereof: but all notes were likewise lost with my other things. Yet I have begun afresh; for there are more signal variations in the weights of urines, than one would at first imagin; and when the eye can discover little, but judge two urines to be alike, they may be found to differ very much as to weight. By weight, I find observations may be made of affections in the head, which rarely make any visible alterations in the urine. I have found two urines not much unlike, differ two and twenty grains in the quantity of about four or five ounces: but let them that make these essays, weigh all their urines when cold, lest they be thereby deceiv'd. But to return to the spring waters in *Virginia.* There's a spring at my Lady *Berkley's*, called *Green-Spring*, whereof I have been often told, so very cold, that 'tis dangerous drinking thereof in summer-time, it having proved of fatal consequence to several. I never tried any thing of what nature it is of.

There be many petrefying waters; and, indeed, I believe, few of the waters but participate of a petrefying quality, tho' there be few pebbles or paving stones to be found in all the country. But I have found many sticks with crusty congelations round them in the ruins of springs, and stones figured like honey-combs, with many little stars as it were shot in the holes. And nothing is more common than petrefy'd shells, unless you would determine that they are parts of natural rock shot in those figures, which, indeed, I rather think; but thereof hereafter. Mr. Secretary *Spencer*, has told me of some waters participating much of *alome* or *vitriol* towards *Potomack.* Up beyond the falls of *Rapahanack*, I have heard of poysonous waters. But these I only mention as a hint to further enquiry of some others, for I can say nothing of them myself.

Of the Earth and Soil.

When you make the capes of *Virginia*, you may observe it low land, so that at some distance the trees appear as if they grew in the water; and as you approach nigher, to emerge thence. For one hundred miles up into the country, there are few stones to be found, only in some places, rocks of iron oar appear, which made me expect to have found many waters turn purple with galls, but never met with any. Providence has supplied the common use of stones, by making the roads very good: so that they ride their horses without shooing them; which yet are more rarely beaten on their feet, than ours are in *England*, the country and clime being dry, their hoofs are much harder; for I observed, that take a horse out of the wet marshes, and swamps, as they there call them, and ride him immediately, and he'll quickly be tender-footed. In some places, for several miles together, the earth is so intermix'd with oyster-shells, that there may seem as many shells as earth; and how deep they lie thus intermingled, I think, is not yet known: for at broken banks they discover themselves to be continued many yards perpendicular. In several places these shells are much closer, and being petrefied, seem to make a vein of a rock. I have seen in several places, veins of these rocky shells, three or four yards thick, at the foot of a hill, whose precipice might be twenty yards perpendicular, whose delf, I suppose, shot under the hill. Pieces of these rocks broken off, lie there, which I suppose, may weigh twenty or thirty tuns a piece, and are as difficult to be broken as our free-stone. Of these rocks of oyster-shells that are not so much petrefied, they burn and make all their lime; whereof they have that store, that no generation will consume. Whether these were formerly oysters, which left by the subsiding seas, (as some suppose, that all that tract of land, now high ground, was once overflowed by the sea,) were since petrefied, or truly stones, *sui generis*, I leave to the honourable society to determin. But when I consider the constant and distinct shooting of several salts, nature's curiosity, in every thing, so far exceeding that of art, that the most ingenious, when referr'd thereto, seem only endued with an apish fondness, I cannot think any thing too difficult or wonderful for nature; and, indeed, I do not apprehend, why it may not be as feasible to suppose them to have been rocks, at first shot into those figures, as to conceive the sea to have amass'd such a vast number of oyster-shells one upon another, and afterwards subsiding, should leave them covered with such mountains of earth, under which they should petrefie: But not to launch forth too far

into those disputes, since I must modestly remember to whom I write. Often, in the looser banks of shells and earth, are found perfect teeth petrefied, some whereof I have seen, could not be less than two or three inches long, and above an inch broad: tho' they were not maxilary teeth, the part that one might suppose grew out of the jaw, was polish'd, and black, almost as jett; the part which had been fasten'd in the jaw and gums, was brown, and not so shiningly polished, or smooth; if they were, as they seemed to be, really teeth, I suppose, they must have been of fishes. The back-bone of a whale, and as I remember, they told me of some of the ribs, were digg'd out of the side of a hill, several yards deep in the ground, about four miles distant from *James Town* and the river. Mr. *Banister*, a gentleman pretty curious in those things, shewed me likewise the joynt of a whale's back-bone, and several teeth, some whereof he said, were found in hills beyond the falls of *James River*, at least a hundred and fifty miles up into the country. The soil in general is sandy. I had designed, and I think it might be worth a critical remark, to observe, the difference of soils seem appropriated to the several sorts of tobacco; for there is not only the two distinct sorts of a sweet-scented, and Aranoko tobacco, but of each of these be several sorts much different, the seeds whereof are known by distinct names, they having given them the names of those gentlemen most famed for such sort of tobacco, as of *Prior* seed, &c. Nay, the same sort of seed in different earths, will produce tobacco much different, as to goodness. The richer the ground, the better it is for Aranoko tobacco, whose scent is not much minded, their only aim being to have it specious, large, and to procure it a bright kite's foot colour. Had not my microscopes, &c. tools to grind glasses, been cast away, with my other things, I had made some critical enquiries into their several natures; I would have examined what proportion of salts, all the sorts of earths had afforded, and how water impregnated with their salts, would have changed with infusing galls, how with the syrup of violets, and how they would have precipitated mercury, or the like, and so far forth as I had been able, examined them by the several tryals of fire. I conceive tobacco to be a plant abounding with nitro-sulphurious particles; for the planters try the goodness of their seed, by casting a little thereof into the fire, if it be good, it will sparkle after the manner of gun-powder: so will the stalks of tobacco-leaves, and, perhaps, has something analagous to the narcotick sulphur of *Venus*, which the chymists so industriously labour after. The world knows little of the efficacy of its oyl, which has wonderful effects in the curing of old inveterate sores, and scrophulous swellings, and some, otherwise applied and qualified. The goodness of tobacco, I look on, primarily consists in the volatility of its nitre: and hence the sandy grounds that are most impregnated therewith, and whose nitrous salt is most volatile, for such grounds are quickliest spent, yield tobaccoes that have the richest scent, and that shortly becomes a pleasant smoak; whereas, in tobacco that grows on stiff ground, the salts seem more fixed, and lock'd up in the oyl, so that whilst new, 'tis very heady and strong, and requires some time for its salts to free themselves, and become volatile; which it manifests, by its having an urinous smell. The same reason satisfies why tobacco that grows on low lands as far as the salts, tho' the plant be never overflowed with salt-water, yet the ground that feeds the plant, being impregnated with salt-water, that tobacco smoaks not pleasantly, and will scarcely keep fire, but do all that a man can, will oft go out, and gives much trouble in frequent lighting the pipe, 'till after it has been kept some considerable time: which may be assign'd to the fixeder saline particles of the marine salt in these plants, which require more time e'er they be render'd volatile. Here it might be worthy an enquiry into the nature of filtration of plants, since we may hence gather, particles of the marine salt are carried along with the *succus nutritius* of the plant; concerning which, if it were not too much to deviate from the matter in hand, I should offer some reflections of my own, which the learned society might perhaps improve: for I think, thence might be made many happy conjectures as to the virtues of plants. So where we see plants, or trees, of an open pore, growing low, we shall find their juice has subtile parts: so have all vines, whether the grape vine, or briony, or a smilax, or the like. If a gummous plant or tree, that grows low, and close pored, it abounds with acid spirits, as *lignum vitæ*, &c. if it grow tall, and be open pored, it abounds with a subtile volatile spirit, as your firrs, and the turpentine tree. But to insist no further herein, than as this may be applicable to the present discourse: for I have observed, that that which is called pine-wood land, though it be a sandy soil, even the sweet-scented tobacco that grows thereon, being large and porous, agreeable to Aranoko tobacco; it smoaks as coursly as Aranoko: wherefore, 'tis, that I believe the microscope might make notable discoveries towards the knowledge of good tobacco: for the closer the composition of the leaf, the better the tobacco; and, therefore, the planters and merchants brag of the substance of their tobacco; which word, did they always take it in a true sence, for the solidness, and not mistake it for the thickness, it would be more consonant to a true observation: for as I said of the pine-wood tobacco, some of it is thick and not solid, and differs from the best tobacco, as buff does from tann'd leather; so that if the tobacco be sound and not rotten, you may give a great guess at the goodness of tobacco, when you weigh the hogsheads, before you see them: for if an equal care be taken in the packing of them, the best tobacco will weigh the heaviest, and pack the closest. Now I said, that the sweet-scented tobacco most in vogue, which was most fam'd for its scent, was that that grew on sandy land; which is true, if you would smoak it whilst new, or whilst only two or three years old; but if you keep the stiff land tobacco, which is generally a tobacco of great substance, five or six years, it will much excel: for though the sandy land tobacco abound with a volatile nitre at first, yet the stiff land tobacco abounds with a greater quantity of nitre, only that it is lock'd up in its oyl at first, and requires more time to extricate itself, and become volatile; but the pine-wood land having little of the nitro-sulphurious particles, neither is, nor ever will make any thing of a rich smoak. Discoursing hereof some days since, to a gentleman of good observation, that has been versed with maulting, he assured me, to back this, my supposition or hypothesis, he had observed, that barley that

grew on stiff ground, required more time considerably to mellow, and come to perfection, than that that grew on light land. Having proceeded thus far to speak of tobacco, I shall add one or two things more. The planters differ in their judgments about the time of planting, or pitching their crops: some are for pitching their crops very early, others late, without any distinction of the nature of the soils; and 'tis from the different effects that they find, in that, sometimes early, sometimes the late planting succeeds: but they have not the reason to judge of the cause, to consider the accidents of the year, and the difference of the soils. In sandy grounds they need not strive so much for early planting, the looseness of the earth, and the kind natur'd soil, yielding all that it can, easily and speedily, and sand retaining the heat, makes the plants grow faster. But in stiff soils, if the crops be not early pitch'd, so that during the season of rains it have got considerable roots, and shot them some depth, if early droughts come, it so binds the land, that the roots never spread or shoot deeper, or further than the hill that they are planted in: for they plant them as we do cabbages, raising hills to set every plant in, about the bigness of a common mole-hill: observing this on the plantation where I lived, that it was stiff ground, I advised them to plant their crops as early as possible; and in order thereunto, I tried several ways to further the plants; but not to trouble you with the several experiments that I made, in reference thereto: what I found most advantageous was, by taking an infusion of horse-dung, and putting thereon soot, and then my seeds; this I kept forty eight hours in an ordinary digestive heat. I had two beds left me to sow, in the midst of those the people sow'd, and the quantity of seed that they generally allotted to the same quantity of ground; when I sow'd, I mix'd ashes with the seed, having decanted the liquor, that the seed might sow the evenner. The effect was, that my plants came up much sooner, grew swifter, and I had five plants for one, more than any of the other beds bore; I left the country shortly after, and so no certainty of the final result. There be had various accidents and distempers, whereunto tobacco is liable, as the worm, the fly, firing to turn, as they call them, Frenchmen, and the like. I propos'd several ways to kill the worm and fly, as by sulphur and the like; but had no opportunity to experiment it: I shall set down that I had most hopes of which, perhaps, may give a hint to others to try and improve. Tobacco-seed is very small, and by consequence, so is the young plant at first, that if gleamy weather happen at that time, it breeds a small fly, which consumes the plume of the plant; now it being early in the year when they sow the seed, *viz.* about the fourteenth of January, they cover the ground, to secure, as well as they can, their tender plants, from the nipping frosts, that may happen in the nights; they cover them only with a few oak-leaves, or the like; for straw they find apt to harbour and breed this fly: I therefore would advise them to smoak straw with brimstone, once in two or three nights, and so they might cover them securely, with that which would preserve them infinitely beyond the covering with oak-boughs; indeed, I would advise them to keep peculiarly so much of their Indian corn-blades, which they gather for their fodder, for this very purpose, being as I conceive, much the best, there being no chaff to foul their beds, and prejudice them when they should weed them. What they call firing is this: when plants are of small substance, as when there has been a very wet and cold season, and very hot weather suddenly ensues, the leaves turn brown, and dry to dust: the cause I conceive to be hence: the plant being feeble, and having a small quantity of oyl, which makes the more solid part of the plant, the earth being suddenly heated by the sun's fiercer beams, the roots are rather scorch'd and dried up in the earth, than nourish'd; so that the plant consisting only of watery parts, is consumed, as it were, by fire: sometimes hopeful plants, when by a suddain gust some master veins are broken, if suddain heat ensues, they likewise fire: for being not come to maturity, and being deprived of the supports of life and vegetation, they likewise perish, are dried up, and fall to dust. *French-men*, they call those plants, whose leaves do not spread and grow large, but rather spire upwards, and grow tall; these plants they do not tend, being not worthy their labour. Were they so critical, I believe, they might have great guess what plants were most likely to turn *French-men*, by observing whether the roots of the plants run downwards, as those whose branches are aptest to spire upwards: for though I have not made positive proof thereof, I have something more than bare fancy for my conjecture. I have pull'd up some of these *French-men*, and compar'd them with the roots of some other plants, and found them much longer than others; and 'tis observeable, loose soils, and sandy ground, are more subject thereto than the stiff land. The country of itself is one entire wood, consisting of large timber trees of several sorts, free from thickets or under-wood, the small shrubs growing only on lands that have been clear'd, or in swamps; and thus it is for several hundreds of miles, even as far as has yet been discovered. But that shall be reserved 'till another opportunity.

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN MARCH, 1836, FOR IMPROVEMENTS OF MACHINES, &c. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For making *Vegetable Extracts;* Thomas Close and John C. Standford, Rye, West Chester county, New York, March 18.

"The process consists in forcing through the cut, bruised, or powdered, particles of vegetable substances, a volume of steam, water, or other liquid, under and by a pressure, varying in intensity, according to the nature of the substances to be acted upon."

This patent is not taken for any particular form of apparatus; but a description is given of one which is considered and claimed as new. The pressure is to be continued for a longer or shorter period, according to the nature of the substance to be acted upon, and it is said that "the coloring matter, tannin, and other soluble parts of the wood or vegetable substance will be immediately and perfectly extracted, and with the use of a much less quantity of water, and in much less time than

would be required by the ordinary process of boiling, infusion, or steeping, leaching, &c."

The patentees claim to be "the original discoverers and inventors of the art of extracting the soluble parts of vegetable substances, by means of the heavy pressure of steam, water, or other fluids, exerted upon and through the materials to be acted upon, however the pressure may be effected. Also the combination of the chamber and perforated lid as described; the combination of the boiler, water pipe, and steam pipe, with said chamber, and its said apparatus for the purposes aforesaid."

The whole process is well described, and we are not aware of any theoretical, or practical, objection to it; but, on the contrary, it appears to us that for many purposes it may be used with great advantage.

For a *Portable Cooking Stove;* Charles Vale, Newark, Essex county, New Jersey, March 18.

This stove, it appears, is intended to cook by means of anthracite, or charcoal, as fuel: but we are unable, from the description and drawing, to form any clear idea of its construction and use. There are letters of reference used, and figures refiered to, in the description, which are not to be found in the drawing; we therefore must dismiss the affair.

For a *Hemp Brake;* John Pursell, Perrryville, Mercer county, Kentucky, March 18.

The brake is made in the ordinary form, the patented improvement consisting in working the vibrating swords by means of a treadle, in the downward stroke, and in raising them by means of springs.

For *Manufacturing Salt from Salt Water;* Richard K. Cralle, Lynchburg, Campbell county, Virginia, March 18.

A very full description of the apparatus employed is given in the specification, after which the patentee says, "What I claim as my own invention, not heretofore known or used, in the above described machine, is the application of the principle of evaporation *in vacuo*, to the manufacture of coarse and common salt. I claim to have invented the means of applying a known principle in physics, to the new and useful purpose of salt making. The machine may be varied in construction, and the principle applied in other modes; but I claim to be the original inventor of the means of applying the principle of evaporation *in vacuo* to the manufacture of coarse and common salt."

The apparatus, as shown in the drawings, is intended merely to exemplify the principle, and not to furnish a definite arrangement; the description of it is elaborate and clear, but we find nothing to designate in what "its construction is peculiar to the purpose;" and therefore cannot tell what is claimed; this ought to have been distinctly set forth, as, in our opinion, it would form the only foundation for a valid claim. It has been decided that the application of a known machine to a new purpose is not patentable. To apply the same mode to the evaporation of water from a solution of salt, which has been applied so extensively to its evaporation from a solution of sugar, cannot fairly be called an invention, however useful it may be. If geese had never been roasted, although turkies had been usually cooked in that way, a patent for roasting geese would hardly be sustainable.

For a *Metallic Mill;* Joseph C. Gentry, Dayton, Montgomery county, Ohio, March 18.

A cast-iron cylinder is to be banded, or otherwise covered, with cast-steel, then turned smooth, and picked with a pointed, steel tool. A concave of cast-iron, forming nearly a half circle, is to be adapted to the cylinder; and ribs, or bands, of cast-steel, projecting about one sixteenth of an inch from its surface, or to be inserted in dovetail grooves, extending the whole length of the concave; these also are to be filled on their surfaces. The concave must be sufficiently open at one edge for feeding, and the cylinder is to be held down by springs, to prevent injury from the introduction of hard substances.

"What I claim is the steel or other metallic ribs, and the manner of fixing them in the concave. And the cast-steel or other suitable metal, plated or banded on the cast cylinder. The manner of relieving the action of the cylinder by springs back of the boxes, on which the journals rest. The manner of picking the cylinder and ribs, presenting the sharp edges to each other, as described above."

Such a mill would be costly, easily put out of order, and difficult to repair. We are very apprehensive, also, that, when in the best order, it would not make very good flour. The claims embrace too many individual parts of the mill, some of which would not be able to stand alone.

For a *Mortising Machine;* George Page, Keene, Cheshire county, New Hampshire, March 18.

The general resemblance in principle between this and some mortising machines which have preceded it, is such as to leave little apparent room for a claim, and it does not occupy a large space, being to "the mode of attaching the slide to the upper lever and that lever to the machine; and also the lower box, and circular brace as described." We shall not take time to describe these particulars, but have no doubt that they are equally good with other modes of attaining the same end, and that the machine, if well made, will work well.

For a method of *Making Pitch;* Henry Ruggles, city of New York, March 19.

The refuse, or tar, such as is left in making gas in the New York gas works, is to be boiled down to the consistence of pitch, and then put into barrels.

"I claim the exclusive privilege of boiling down, either in an open or close vessel, kettle or still, the liquid such as is produced at the New York gas house, in the manufacture of gas, and known there by the name of refuse, until it becomes of the thickness, or consistency of pitch."

The distilling of the spirit from the refuse, or tar, of gas works, so as to reduce it to the consistency of pitch, is a common and well known process in London, and in other places where there are large gas works; the *exclusive* right, therefore, is not likely to be conceded.

For *Backs of Stoves and Fire Places;* William R. Prescott, Hallowell, Kennebec county, Maine, March 19.

A tube of suitable diameter, say nine inches, and two or three feet long, is to be built in the back of a fire place, or fixed, in any convenent way, in a stove; a tube, of about two inches diameter, is to lead from without the room, into this longer tube, to supply it with cold air, and warm air tubes are to lead from either end of it, into the room, to afford a supply of warm air.

The claim is "to bringing, in the manner described, the cold air from without the room to which the fire place is situated and supplying it to the stove, and of thus keeping up a circulation of cold air from without, and of warm air into the room. The application of the apparatus described for fire places, stoves, and fire frames, for the purpose of warming rooms, and its general construction."

Whilst there is nothing new in this principle, the form pointed out for carrying it into effect would be one of the least efficient; the "general construction" is so general, and so extensively employed, that it is a little remarkable it should be claimed as new.

For *Preserving Milk for use on Voyages, &c.;* John Lewis Granger, city of New York, March 19.

Fresh milk is to be put into bottles, and these are to be closed, in the manner of corking, with some porus substance, which will allow air to pass through it; the bottles are then to be put into a vessel of cold water, and the whole gradually heated to the boiling point, after which the porous stopper is to be coverd with wax.

The claim is "to the evolving of gas, and suffering it to escape from the milk, and immediately afterwards excluding the atmospheric air from commingling therewith, by the method substantially as described."

We apprehend that the theory above intimated, namely, that the gas contained in milk is the cause of its spontaneous decomposition, is not founded in fact; were this the case, an exhausted receiver would as effectually effect the object in view, as the boiling heat, and this process would not be substantially as described." There is a chemical change produced in milk by boiling, by which its liability to further reaction is very much diminished, and which would not be produced by the mere expulsion of gas. This theoretical point, we are aware, has nothing to do with the validity of the claim, although we have thought proper to give it a passing notice; we have also something to say about the novelty of the process. In the celebrated report published by the French Government in 1810, on Mr. Appert's mode of preserving all kinds of animal and vegetable substances, milk is mentioned as having been preserved by boiling and corking closely; it was concentrated in the boiling by allowing a portion of its watery particles to evaporate; the process was, we think, substantially the same with the above, the principle of which was perfectly well known.

For a *Cider Mill;* Christian Sheaffer, Lebanon, Lebanon county, Pennsylvania, March 19.

This cider mill is to grind the apples by means of revolving nuts or, toothed cylinders, of which there are three, mashing into each other. All the novelty appears to be in the manner of building the mill. We are told that "the machine consists of two pair of stairs, a frame, an apple mill made of three cog wheels; cage or receiver, a press beam, two main screws, one assistant screw; two weight boxes, &c. &c." After describing the two pair of stairs, and the other component parts of the machine, it is said, "I claim as my invention the whole of the machinery, excepting what I have named the cage or receiver; the bed or box belonging to the cage or receiver, and the manner of mixing the straw with the ground apples, or rather the *smashed* apples." This claim to the whole machinery, cannot be understood to mean the machinery as a whole, but as applying to its component parts individually; scarcely one individual of which could bear the burden thus put upon it, without being *smashed.*

For a *Cooking Stove Grate*, and its appendages; Orrin Wilson, Concord, Middlesex county, Massachusetts, March 23.

The grate to contain the coal, or wood, is made with bars, and, in general, like the ordinary grate of an open fire place; but it is so affixed to a cooking stove, with ovens, or other desired appendages, as that it may be raised vertically, so as to communicate its heat more directly to the cooking department, or lowered so as to form an open stove. Above the grate, a windlass crosses, near the front of the stove, and four chains attached to this windlass, and to the four corners of the grate, serve to raise and lower the latter, as may be desired.

The claim is to "the moveable grate, or pan, whether operated with chains and pulleys, rack and pinion, or other mechanical powers; the peculiar adaptation, arrangement, and combination of the several parts of the stove, fire frame, or fire place, to the said moveable grate, for the uses and purposes herein described and set forth."

For a *Stove*, denominated the Sibelline Stove; Wm. M. Carmichael, Hempstead, Queens county, New York, March 23.

A cylindrical stove, lined with fire clay, is made in the usual manner. The stove is to be surrounded by a second cylinder, leaving an air chamber between the two, with apertures below to admit cold, and others above to discharge warm, air. The whole stove is to stand upon a drum, or pedestal, of a diameter considerably larger than the stove itself, and is to be surmounted by another drum, or hollow dome, elevated a few inches above its top; a smoke pipe from the centre of the top of the stove, conducts the smoke into the drum. Four, or more, hollow columns, connect the two drums, surrounding, but detached from, the body of the stove; these columns form flues between the two drums, and from one of them a smoke pipe leads into a chimney, there being a damper in the column, above the smoke pipe. When this damper is open, the smoke and heated air pass directly through the upper part of the column, and into the exit pipe. When the damper is closed, the draught has then to pass down the three open columns into the lower drum, and up the fourth to the smoke pipe.

"The arrangement and adaptation of the seve-

ral parts of the stove, producing the one before described," constitute the whole claim, which is about tantamount to not claiming any thing. The resemblance between this and the stove patented by Mr. Attwater, at p. 54, vol. xvii. is not very remote; and this latter, as is there described, we view as but a modification of Spoor's stove.

For a machine for *Working off the ends of Casks, and smoothing them;* Sumner King, Suffield, Hartford county, Connecticut, March 23.

A vertical, revolving shaft is to carry a grapple, or a kind of spring chuck, which is to receive and hold the cask that is to be worked off by a leveller, a stock howell, a croes, and a plane. The claim is to "the revolving grapple tub, that secures the cask."

For a *Washing Machine;* Ezekiel Y. Watson, Albany, New York, March 23.

An oblong box, furnished, in its bottom, with a curved row of rollers, upon which the clothes are to be rubbed by a frame of rollers passing over them, constitute the machine; and "the before described machine for washing clothes," forms the claim.

For a machine for *Mortising and Tenoning;* Erastus M. Shaw, Wilbraham, Hampden county, Massachusetts, March 23.

This machine differs in its general construction from most of the mortising machines which we have previously noticed, and by more labor than we can bestow upon it, we think that we might find out the manner of constructing it; but the drawing is very indifferently executed, and to decypher it is a task we shall not undertake. The claim is to "the arrangement and adaptation of the several parts of the machine, producing the one here described for mortising and tenoning timber; particularly the manner of operating the machine, in causing the carriage to move to the right and left, whilst the slide, with the cutter, moves horizontally backward and forward, at right angles to the carriage."

For a *Straw Cutter;* James Hyde, Darien, Genesee county, New York, March 23.

There not being any claim made to any part of this apparatus, we know not what the patentee considers as new about it, and therefore pass it by.

For a *Thrashing Machine;* Hugh and Israel W. Edgar, Wayne county, Ohio, March 23.

This is a cylinder and concave machine, set with spikes, much in the usual way; the patentees claim the form in which they construct the frame, and the manner in which they fasten the spikes by screw nuts, rendering the whole strong and durable.

For an improvement in *Bee Hives;* Sturgess M. Judd, Danbury, Fairfield county, Connecticut, March 30.

The hive said to be improved, is that patented by Levi H. Parish, on the 5th of August, 1834. The claim made "in the suspension of said boxes, and in their movement in grooves, by which the bees are prevented from escaping during the removal of the boxes, as combined in the manner specified; and also the knives for separating the combs between the boxes and the slats." The peculiarities of these parts we leave to be examined by those interested in them.

For a *Horse Mill for Grinding Grain and Scouring Seeds;* John Hairman, Jr., Brownsburg, Bucks county, Pennsylvania, March 30.

The grinding machine consists of two grooved, iron, cylinders, of different sizes, and running with different velocities: one of them having a narrow, fluted, iron concave to aid in the grinding. A horse power, by which the mill is to be driven, is also described, but there is not any representation of it in the drawing; both machines, however, are claimed; the claim being to "the combination and arrangement of the several parts of the horse power in connexion with the grinding machine, as set forth."

However good the inventions might be, the foregoing claims would invalidate them. The whole grinding machine is claimed, yet it possesses but little novelty; the horse power is claimed, yet there is no representation of it, as required by law. And what would of itself be fatal, two distinct machines are included in one patent.

For a *Tide Water Wheel;* Carey S. Mercer, Franklin, Baltimore county, Maryland, March 30.

A horizontal wheel is to be placed in a case, or drum, having flooms at opposite sides thereof, to direct the water upon the buckets, either on the ebb or flow of the tide; guide pieces, or wings, are fixed within the flooms to direct the water upon the buckets; and the claim made is to "the curved guider as described." The contrivance is not worth many words, and we could not talk it into utility.

For an improvement in the *Cotton Planter;* Michael Beam, Buffalo, Lincoln county, North Carolina, March 30.

This patent is obtained for an improvement on a machine patented by the same person, Feb. 13th, 1835. The present contrivance consists, in part, of a barrel shaped reservoir, in which the seeds to be planted are put, and which revolves, as the frame upon which it is supported is drawn forward; it has adjustable openings, for letting out the seed, an apparatus for opening the furrow, and a harrow for harrowing the seed in. The points intended to be claimed consist of the peculiarities of form, structure, and arrangement, which are not very clearly described, and could not be understood without drawings.

For an improved *Franklin, or Open Stove;* John H. B. Swansey, Lynn, Essex county, Massachusetts, March 30.

"The improvement made by me is the addition of two more flues, or drafts, besides the common ones in the Franklin stove. One of said additional flues is to be made a little above the middle of the fire back, and to extend horizontally the whole length of the back, and is to be provided with a common damper, to open and close it. The other additional flue is to be placed along the front plate of the stove."

The drawing does not exhibit the thing very clearly; it does not, however, so far as we can judge, appear to be an affair of much importance.

For *Compressing Hay, &c., and Elevating Heavy Bodies;* Adrastus R. Chamberlin, and Artemas Cleflin, Richmond, Lincoln county, Maine, March 30.

A pinion and wheel are to turn a shaft, round which a chain is to wind, which chain passes over a pulley at the end of a piston rod, that is to carry the follower for pressing. The other end of the chain is to be fastened to some fixed body. Instead of passing over the pulley, on a follower, the chain may be attached to a stump which it is desired to draw from the ground.

The claim is to "the application of the pulley as used by us, for a single or double press; and the application of our machine to the raising of stumps or other heavy burdens." There are so many better machines, for effecting the same purposes, that this will stand but little chance of going into operation; or if it has been used, we apprehend that it will soon cease to do so.

For an improvement in *Wind Mills;* Job Wilbur, Fall River, Bristol county, Massachusetts, March 30.

This is to be a horizontal wind mill, to contain the vanes, or wings, of which, a round building, thirty feet high, and twenty in diameter, is to be erected; the upper part of this building, is made to revolve on the lower, in order to change the situation of two windows, or openings, made for the admission and discharge of the wind. Six vanes, placed on a vertical shaft, in the centre of the building, are to receive the action of the wind; these vanes are to be angled to hold the wind the more effectually.

There is no claim made, a point, in the present case, of no great importance, the structure being very much like others which have been tried, and abandoned.

For a *Machine for Ploughing and Thinning Cotton;* Harvey W. Pitts, Wilsonville, Shelby county, Alabama, March 31.

The claim made is to "the machine as described," a claim which it will hardly bear, as parts of it are very similar to machines which have been used for like purposes; yet we believe there is sufficient novelty in the contrivance to enable it to sustain the character of a new machine. We shall not take time to describe it, as it would be no easy task to render it intelligible without a drawing.

For a *Corn Sheller;* Albert W. Gray, Middletown, Rutland county, Vermont, March 31.

This machine is to operate upon the ears by means of a revolving, flat wheel of wood, set with points, and standing vertically; the ears are to be held up against it by means of a spring conductor. The general arrangements are very similar to those in other revolving, disk shelling machines, and the particular points and combinations which are made the subject of a claim, appear to be unimportant, not, we apprehend, rendering it either better or worse than others previously in use, and now public property.

For *Reflecting Ovens;* Cicero Yan Allen, Penn Van, Yates county, New York March 31.

In the claim appended to the specification of this reflecting oven, we are told about two new principles in it, yet we are at a loss to discover one; it is so much like some other tin kitchens, for baking and roasting before the fire, and our eye so little like that of the inventor, that we cannot see the new parts to which he believes that he directly points. The sides, back, and bottom appear to be rectangular, and the top to slope regularly back; there is a spit for fowls, hooks for birds, bars on which to place pans, a dripping pan to catch the gravy, and a peep hole through which to observe how matters go on, and these constitute the "single reflecting oven."

For a *Self Moving and Accumulative Engine;* John James Giraud, city of Baltimore, March 31.

How many self-moving and accumulative engines have the same parentage with that before us, we cannot recollect, and do not think it worth while to examine, in the patent office, the register of their births; as to their deaths, no register exists, they having all been still born; we know, however, that the family would have been a large one had they received and preserved the living principle. We can tell little about the affair before us, but its author informs us that "the fly wheels run on friction wheels, bearing on the main shaft, and constitute the generating, regulating and maintaining powers of the engine." The power thus generated, regulated, and maintained, is to be applied to "general navigation and other purposes." Happily for the community, however, neither general navigation or other purposes which demand motive power, will consent to wait the generating, regulating, or maintaining power of Mr. G.'s accumulative engine, as otherwise they would never be generated, regulated, or maintained.

For a *Churn;* Thomas Nicholson, New Market, Shenandoah county, Virginia, March 31.

A churn, with a tub in the ordinary form, has a dasher shaft, which is to revolve alternately in reversed directions; for this purpose there are two beveled pinions upon the shaft above the lid; and a beveled segment wheel is to engage first with one, and then with the other of these pinions; such a contrivance is bad in principle, as all machinists know; segment wheels being generally poor things, and as here applied, altogether worthless.

For *Pronged Hoes;* Benjamin F. Boyden, Boston, Massachusetts, March 31.

These hoes are to be of cast-iron, rendered malleable in the usual way. They are to have raised ribs along the prongs, &c. to strengthen them, and to be tinned over their whole surface. The claim is to "the application of cast-iron in the manufacture of agricultural pronged hoes, and covering the same with tin;" but where is the invention or discovery?

For an improved *Winnowing Machine;* Jonathan Bean, Montville, Waldo county, Maine, March 31.

We are told that "the advantages this machine claims above others now in use, consist in durability, portableness, and expedition in cleaning all kinds of grain;" but although the machine claims this, the patentee does not claim the machine; and although he has given a voluminous account

of admeasurement, and many outlines of separate parts of it, its construction is very imperfectly represented, and its peculiarities, if any it have, are unnoticed; the patent, in fact, is a patent for nothing.

For a *Horse Power;* Richard Skinner, Williamson, Wayne county, New York, March 31.

A main wheel, turned by levers, or sweeps, is to turn upon a hub, and axletree, instead of being fastened to a shaft. Nothing more.

For a *Cooking Stove;* Benjamin H. Pearson, Warner, Merrimack county, New Hampshire, March 31.

This stove has an open fire place, in the form of a Franklin; to which is attached an oven, and other contrivances for cooking. The claim is to "heating the oven on five parts; its particular situation to give a draft under the oven, with an open fire-place; the damper; the turning a crank with two half oval wheels to raise or lower the grate in the fire place."

For a *Hydrant;* David Horn, city of Baltimore, March 31.

There is nothing in the principle, and but little in the arrangement, of this hydrant, different from others in common use. The pipe through which the water enters, under ground, has a socket in it that receives a vertical shaft, up which it is to flow to the point of delivery; the lower end of the shaft fits into, and turns in the socket, as a key in a cock, allowing the water to pass into it when in the proper direction, and when turned round a quarter of a circle, the water in the shaft runs into the ground through a waste hole in the socket.

From the Maine Farmer.

MAKE YOUR BULLS WORK.

There is a practice among our farmers of letting their bulls be idle. Their oxen and their horses work, but their bull, if any they keep, is a gentleman. He does nothing and of course gets fat and lazy. Now an animal of this kind in our state is not a very profitable one. We know from experience, that anxious as many are to improve their stock, they are *as anxious* to have it improved for little or nothing as they are that it should be improved at all. We are sorry to say that this is the case, but facts are stubborn things.

Now if a farmer would make as much profit from them as he ought, he must put him into the yoke and make him toil and tug as well as his oxen. They are rather bad characters to break and discipline, but when it is once done, they are excellent for labor. We know of one or two at this present time that are used to the yoke, and more powerful animals of their inches cannot be produced.

There is no danger of injuring them if they are properly fed and judiciously driven. When kept up in a stall or small yard; they are exceedingly apt to become lazy and sluggish, and ultimately good for nothing at all.

We have had them become so lazy, that they were totally useless for any purpose, and were under the necessity of driving them about every day for exercise in order to invigorate them and bring them to a proper state of health and activity. But the same animal when yoked every day, would never manifest any thing of the kind, but would always be "on hand" when his services were wanted.

This, therefore, is proof positive that work is a good regimen for them, and indeed the only way in which they should he used, provided they are kept in a thriving condition, as every one would desire to keep his teams in order to make them profitable. We hope that our friends will keep an eye to the improvement of their stock. It is true that stock has been depressed in the market for two years past, but whoever lives to see another year, will find it advancing in price, and good stock will be in demand. Look out then for the main chance; be active and generous, and suffer no opportunity for reasonable improvements to escape.

From the New England Farmer.

ENCOURAGEMENT OF BEET ROOT SUGAR.

An order has been introduced in the legislature, and adopted, authorizing the Committee on Agriculture [of Massachusetts] to inquire into the expediency of affording legislative aid to the culture of the beet root, and the manufacture of sugar from that article. A bill will undoubtedly be reported favorable to the measure.

From the Newburyport Herald.

PEAT FOR FUEL.

At this cold season, when wood is so high and a good comfortable fire is so necessary, he is a benefactor, who will point out a new source of *burnables*, (if we may make an awkward word.) Now the fact is, that nature has provided fuel enough for the wants of man: it becomes scarce by our inattention, our folly, or our pride. The fields and meadows around us are rich in stores more valuable than the silver of the mine. It is astonishing to us, that at this season, when wood is decaying and money is scarce, more use is not made of *turf* or *peat*, which makes a very warm and cheap fire. There are two reasons why this article has fallen into neglect; the one is, it is supposed to give a disagreeble odor while consuming; and the other is, a farmer dislikes to dig it, because it must be cured at a most busy season of the year. As to the first, there is all the difference in the world, between peat of different kinds. Select a good meadow, let it be dried, and there is no bad smell—it burns as freely as the best Liverpool coal. We recently stopped at the house of a gentleman in Topsfield, who uses it entirely, and never saw or felt a more agreeable fire. It is true, that bad peat is wretched stuff; but the best is about the best fuel that you can find. As to the other reason, it is true it must be dried at a bad time for the farmer. But why might not a man make the procurement of it, his principal business? We venture to say, there is no way in which capital and time would turn to so much account. A single acre of good meadow will yield some thousands of cords. Suppose two men in a season to cure and deliver a thousand cords, (which might easily be done,) it would (at least this season) have

commanded $5000. This is no small sum for the profits of a single year. Here then is a source of public benefit and private wealth. It must be allowed that the maxim of most people is—"Far fetched and dear bought." But why not use the wealth that lies at our very doors? We are persuaded that nothing but a knowledge of the merit of this article, and a smile from that capricious lady, Fashion, is necessary to make the use of it very general. It is not so dusty nor so cumbrous as the anthracite coal, which we buy so dear and bring so far. Let us try it. Who will take our hint? At any rate, fashionable or not, well-cured peat, now in the market, would command five dollars a cord from somebody.

From the New England Farmer.

AGRICULTURAL SURVEY OF THE COMMONWEALTH OF MASSACHUSETTS.

We have been informed, and are much pleased to learn, that a topographical survey of this state, with particular reference to its agriculture, under the sanction of the legislature, is in contemplation. Surveys of this kind have been accomplished in Great Britain and Ireland, and the results have been very useful and interesting. Almost every cultivator has some improvement, or peculiar mode of tillage, some new or improved seed, plant, fruit, breed of animals, mode of treating their diseases, some new and and superior implements for facilitating and adding efficacy to labor; something peculiar in his practice of the art of husbandry, which, if generally known, would be generally adopted, and prove beneficial to every individual of the great family of man. The knowledge derived from actual survey, sanctioned by ocular demonstration, and correctly reported, could have none of the disadvantages attributed to *book farming*. It would be the results of experience, communicated, for the most part, by men who practice what they communicate, and who cannot afford to practise incorrectly.

In carrying into effect a survey of the kind alluded to, much—almost everything would depend on the agricultural knowledge and judgment, as well as industry, of the person or persons to whom the surveys may be entrusted. It would be easy to accumulate masses of matter, as flat, stale and unprofitable as the figures in the calendar pages of an old almanac; but if the inquirer knows what has been in use, and is capable of judging of what might be found useful in rural economy, mines of information might be explored, more valuable than those of Golconda or Potosi.

In order to obtain valuable results to the researches, said to be in contemplation, a *system* should be pursued as regards objects of inquiry. In Great Britain, the following course, or something similar, was usually adopted:—

Survey of Middlesex.

Middlesex is part of the north side of a vale watered by the Thames, and contains 179,200 acres, exhibiting a great variety of agriculture.

1. *Geographical state and circumstances.*

Climate.—Healthy; warmer near London, from the fires kept there. Stationary winds from south west and north east. In spring, frost in the hollows, when none on the hills: thermometer has been as high as 83°, and as low as 6° below zero.

Soil.—By long continued manuring, the surface soil almost every where looks like loam.

Surface.—Gently waving; highest towards the north; Hampstead 400 feet above the level of the sea, &c.

Mineral Strata.—1. Cultivated surface. 2. Gravel of flints, &c. Water: Abundant and excellent. The Thames falls about 24 feet in ten miles. Mineral waters, at East Acton, Hampstead and Bagnigge wells. Fish caught in the Thames: sturgeon, salmon, tench, &c. Spring water found at various depths, from 5 to 300 feet; the latter the depth at Paddington.

2. *State of Property.*—Estates generally under the care of attorneys and badly managed. Tenures: much freehold, considerable extent of copyhold, some church, college and corporation land.

Then follows: 3. Buildings; 4. Mode of occupation; 5. Implements; 6. Enclosing; 7. Arable land; 8. Grass lands; 9. Gardens and orchards; 10. Woods and plantations; 11. Improvements; 12. Live stock; 13. Rural economy; 14. Political economy; 15. Obstacles to improvement; 16. Miscellaneous observations; 17. Means of improvement.

Other topics of inquiry might be added to, or substituted for some of the above mentioned; and, perhaps, circular letters containing queries relative to such points of information as are thought of the greatest consequence, might be sent to intelligent cultivators, in the towns about to be visited for the purposes of agricultural surveys, &c. By such and other means which will suggest themselves to practical and ingenious cultivators, a mass of information may be elicited which will be of a value, scarcely to be overrated by the most sanguine anticipations.

From the Saratoga Sentinel.

ELECTRO-MAGNETIC ENGINE.

In company with Dr. Steel and several other gentlemen, we called upon Messrs. Davenport and Cook, of this village, on Saturday, with a view of examining the electro-magnetic engine invented by the senior partner.

The ingenuity, yet simplicity of its construction, the rapidity of its motion, together with the grandeur of the thought that we are witnesing the operations of machinery propelled by that subtle and all pervading principle, electricity, combine to render it the most interesting exhibition we have ever witnessed.

Although we shall say something on the subject, it is perhaps impossible to describe this machine by words alone, so as to give more than a faint idea of it to the reader.

It consists of a stationary magnetic circle, formed of disconnected segments. These segments are permanently charged magnets, the repelling poles of which are placed contiguous to each other. Within the circle stands the motive wheel, having projecting galvanic magnets, which revolve as near the circle as they can be brought without actual contact. The galvanic magnets are charged by a battery, and when so charged, magnetic attraction and repulsion are both brought into requisition, in giving motion to the wheel—

the poles of the galvanic magnets being changed more than a thousand times per minute.

Having in its construction but one wheel, revolving with no friction except from its own shaft, and from the wires connecting it with the galvanic battery, the latter of which can scarcely be said to impede the motion in any degree, the durability of this engine must be almost without limit.

There is no danger to be apprehended from fire or explosions: and we understand it is the opinion of scientific gentlemen who have examined it, that the expense of running this machine will not amount to one fourth as much as that of a steam engine of the same power.

From the time when the Greek philosopher supposed the magnet possessed a soul, its mysterious power has been regarded with increasing interest and attention to the present day. In addition to its utility in the compass, thousands have labored in vain attempts to obtain through its agency a rotary motion. So intense has been the application of some to this subject, that in the attempt they have even lost that elevating attribute of our species, reason. It was reserved for Mr. Davenport to succeed where so many had failed.

He commenced his labors more than three years ago, and prosecuted them under the most discouraging and unfavorable circumstances—sustained by a constitutional perseverance and a clear conviction of ultimate success. He obtained his first rotary motion in July, 1834; since which time he has devoted his whole attention to improvements in his machine. During this period it has passed through five different modifications, and is now brought to such a state of simplicity and perfection (having apparently the fewest possible number of parts,) that the proprietors consider no further important alterations desirable, except in the due proportions of the different magnets, in which they are daily improving.

We were shown a model in which the motive wheel was $5\frac{1}{2}$ inches diameter, which elevated a weight of *twelve pounds*. And to illustrate the facilities for increasing the power of this engine, another model was exhibited to us with a motive wheel of eleven inches in diameter, which elevated a weight of *eighty-eight pounds*. Although these models have been for some time in progress, and we have occasionally been permitted to examine them, we have waited till the present period, when the practicability of obtaining a rapid and unlimited increase of power seems to be placed beyond a doubt, before expressing an opinion, or calling the public attention to the subject.

If this engine answers the expectations of the inventor, (and we believe no one can assign a *reason* why it should not,) it is destined to produce the greatest revolution in the commercial and mechanical interests, which the world has ever witnessed. We may consider the period as commencing when machinery in general will be propelled by power concentrated upon the plan of this engine; when the vessels of all commercial nations will be guided to their point of destination and urged forward in their course by the same agent, triumphantly contending against winds and tides, with the silent sublimity of unseen, but irresistible power!

The prophetic ken of science is happily exhibited by Dr. Lardner, in his Treatise on the Steam Engine. His far seeing genius seems to have anticipated the invention of which we are speaking. "Philosophy," said he, "already directs her finger at sources of inexhaustible power in the phenomena of electricity and magnetism, and many causes combine to justify the expectation that we are on the eye of mechanical discoveries still greater than any which have yet appeared: and that the steam engine itself, with the gigantic powers conferred upon it by the immortal Watt, will dwindle into insignificance, in comparison with the hidden powers of nature still to be revealed; and that the day will come when that machine, which is now extending the blesssings of civilization to the most remote skirts of the globe, will cease to have existence, except in the page of history."

From the ingenuity, perseverance, and mechanical skill of Ransom Cook, Esq. who has himself made an important invention in this engine, and has undertaken to bring the same into use, we anticipate a speedy introduction of its merits to the public. It is hoped that he may prove a second Livingston to another Fulton. He is about to depart for our large cities, in some of which he contemplates the erection of powers for mechanical purposes.

Several individuals, agents of Messrs. Davenport and Cook, are also departing with models to secure letters patent in the different countries in Europe and South America.

For the Farmers' Register.

REMARKS ON THE AGRICULTURE OF NELSON AND AMHERST.—NO. I.

Nelson, January, 1837.

Dear Sir:—All those who have received pleasure or instruction from the perusal of the Register, will feel the force of the application you make in your December number, for literary contributions. Being myself one of that number, (although, heretofore certainly not intending to write on the subject of agriculture,) I regard it now as proper to make an attempt at reciprocity for the labors of others. And, in truth, there never was a time when it was more incumbent on those who wish well to Virginia, to endeavor to show that the efforts of the agriculturist may be compensated here, and that there is no necessity to fly from sterility at home, to climates far more unfavorable to health and life, in order to procure the means of comfortable subsistence. If bills of mortality were accurately kept for the south-western states, it would be seen at what an enormous sacrifice of life those countries are settled, by persons who leave climates where health may be enjoyed, and where tolerable agricultural skill, with industry, would furnish in abundance the necessaries of life. That I know to be the case in the country lying on the eastern side of the Blue Ridge, from my own experience—and yet scarcely any other presents to the eye of the traveller, a more wasted appearance. The old fields exhibit numerous galls and gullies, whilst decayed fences show, in many cases, the ground is abandoned, because, in the language of the country, it is *worn out*. Yet a farm is occasionally seen in quite a different condition, where the land, not in tillage, is covered with good crops of clover and other grasses, and that under the plough, from the burthen it bears, promising an adequate return for the labor bestowed.

This difference, at the first glance, is seen to spring from a different system of management. Let us briefly contrast them. The old consisted, and, in many places, yet consists, in clearing land, however steep, and cultivating it in tobacco, planted in hills, made for the purpose in rows running directly up the ascent, leaving a space between them, in which the water of heavy rains collects in torrents, and bears off a portion of the soil to the plain below. Year after year, the land is cultivated in tobacco, until the crop fails so much as to threaten loss to the planter. Then the ground is put in corn—the crop worked by shovel ploughs, cutting a shallow furrow, in many instances, directly up hill, loosening the surface just enough to be carried off by the first heavy rain. Wheat follows corn, and corn wheat, until the land is nearly exhausted. Then perhaps a year of what is called *rest* is given, which consists in turning in the stock of the farm to eat up every vestige of vegetation that appears during the season. In advanced stages of decline, rye and oats are substituted for wheat, and when numerous galls and gullies are formed, and broomstraw covers the residue of the field, it is abandoned as worn out, and thrown into common. The new mode is, simply to adopt the convertible husbandry, to follow grain crops with grass, principally red clover, to allow the land to remain under grass two or more years, before it is again subjected to the plough, to avoid close grazing, and to apply the manures of the farm-pens, stables, &c. The increase of crop is so immediate, and so considerable, from this better husbandry, that to those who are not aware how many prejudices exist in agriculture, and how extremely difficult it is for cultivators of the earth to change any of their habits, an adherence to the old mode seems unaccountable—habits, perhaps, more pernicious in a hilly country like this, where washing rains are so frequent and destructive, than in any other. Men, apparently with as good natural endowments as the rest of their species, have settled on lands here in the forest state, have built good houses, and made other expensive improvements, and yet have pursued such a system of culture, as rapidly impoverished their fields, and inevitably doomed them to sterility, before, in the course of nature, their own lives might be expected to terminated. To move in old age to a distant land, and encounter the privations and difficulties of a settlement in the wilderness, among pestilential marshes, howling wild bests, and men nearly as savage, is an arduous task; to remain at home in circumstances daily becoming more straitened, as the wants of a growing family are increasing, is little less perplexing. Yet this has been the dilemma of so many Virginians, and continues to be so to such an extent, that an examination of the means by which it may be avoided, may be useful, if it should prove the instrument of rescuing even one individual from that situation. The first step would seem to be, the exposure of the prejudices so operative in producing this result, and particularly with regard to the tobacco crop, which will doubtless long continue to occupy a large portion of the labor of this country.

It is extensively believed that its culture is inconsistent with the improvement of the soil, from the large quantity of labor it requires. It is true, the culture of tobacco requires a large portion of the time and attention of the laborers of a farm, where it constitutes an important ingredient of the crops raised; but under a better system than that in common use, time enough is left, not only to prevent the farm from retrograding, but to maintain it in a state of progressive improvement. Instances exist in this country where tobacco has been largely coultivated for more than twenty years, and yet the general fertility of the farm has been more than doubled in that time.

Tobacco is believed by many to be one of the most powerful of exhausters, not only directly, but indirectly, by exposing the land to wash more than any other crop. As a direct exhauster, I think it less potent than Indian corn, wheat, rye, or oats. It affords the best preparation for the wheat crop, known to me—decidedly better than a naked fallow. It is true it exposes the land to wash under the ordinary management, not only more than any other crop cultivated by us, but so much, as to render the preservation of the fertility of the soil exceedingly difficult. But a better system is within the reach of every planter, which, at least, does not diminish the quantity or quality of the plant, whilst it preserves the soil. This system, I will endeavor hereafter to describe.

Those prejudices, by producing apathy, prevent the search after improvement which is indispensable to success.

Many suppose the nature of the labor employed in the southern states, is incompatible with an improving system of agricultue. The writer is convinced, from his own experience, it is better than the hired labor of the greater portion the non-slaveholding states.

In bodily health and strength, the black is fully equal to the white man. And as to willingness, necessity alone produces labor from the operative classes of any color. The agriculturists of the *free states*, as they are called, must closely inspect the work of their hirelings, to obtain an adequate return for their wages—and a serious neglect in that respect, would be soon followed by ruin. Where population is dense, and the competition for employment active—where it is a favor to be employed, and a serious evil to be rejected, then the landholder acquires a control over his hired labor that renders it very efficient. But where the demand for labor exceeds the supply, and the discharged laborer is eagerly employed, immediately after his dismissal by others, the case is widely different. And this is, in truth, the situation of most of the northern, and all the northwestern states. Did the landholders of the south bestow as much personal attention to their farms, as those of the north, and northwest, the impropriety of many of their practices would be forced upon their attention, and the adoption of better habits with steady industry, would speedily show their results. But the control they possess over their labor, enables them to delegate it to overseers. Crops are made with considerable injury to the soil by those who neither know or care how to preserve it. Ruin does not come so soon from neglect of busines, as it would to the northern landholder: it, nevertheless, too often comes at last; and when the soil is destroyed, the master finds subsistence for himself and slaves reduced to a scanty pittance. Paradoxical as it may seem, it is in truth the superiority of our labor that contributes to the cadaverous aspect of our country:

it enables us to live with much worse management than would be used, were it of an inferior description. If we were compelled to pay our laborers high wages, in money, every year, and the crop cultivated by them would not yield the means, the first year would close the business. But we give only victuals and clothes. Our capital, the soil, wastes so imperceptibly, we are scarcely aware of it; and finally when nothing more is to be obtained from it, we lay the blame on every thing but our own neglect and ignorance.

(*To be continued.*)

ON THE PRAIRIE LANDS OF ALABAMA, AND THE CAUSE OF RUST IN COTTON, SO FREQUENT ON THOSE LANDS.

To the Editor of the Farmers' Register.

——————— Jan. 25, 1837.

Dear Sir:—I received day before yesterday the earlier volumes of the Farmers' Register, ordered to complete my set, together with the sheet containing your essay on prairies, to which you have asked my attention.

* * * * *

Your theory of the formation of prairies* is, I have no doubt, the true one, and will claim the assent of every intelligent man who knows any thing of that interesting region. I live in Lowndes county, Alabama, the heart of the prairies—and I have always been convinced that they were produced by some original difference in the soil, and not from burnings, as has been idly suggested. That difference in soil you have doubtless pointed out, and if I had time, I could support your theory by a great number of facts, coming within my own knowledge; and I could show that the exceptions appearing to disprove your positions, are the strongest confirmations. The subject is of great importance to my section of country, and its investigation will, I have no doubt, lead to the discovery of the cause, and to the prevention of the rust in cotton, the most serious drawback on the value of that kind of land. I think you are wrong as to its being for want of *sand*. It is excess of *both lime and vegetable matter*, forming a chemical combination, and when that excess is overcome either by clay or sand, I have no doubt a cure would be effected; by clay, however, sooner than by sand. I believe the same result would be obtained by an increase of vegetable matter, which would neutralize the excess of lime. Lime, however, without a considerable amount of vegetable matter, cannot form that chemical combination which, in my opinion, rusts cotton. Hence on the peaks of prairie hills, where the lime exists almost alone, in a white chalky state, and where the soil is so poor as to produce scarcely anything, the land, by a *slight* application of vegetable matter, quickly improves, but never gets that peculiar loose, black, friable, and rich state which rusts cotton. This is the kind described in analysis No. 20, of your Essay on Prairies, (p. 332, vol. iii. Farmers' Register,) and though from poverty it produces but little cotton, it never rusts.

I can, by merely riding over prairie land, tell where it will rust. The rusting soil is always rich, deep, porous, and dry for a considerable depth below the surface, say five inches. It can be ploughed by a wooden plough, and is exceedingly fine for corn. The cotton plant requires a firmer and more compact subsoil for its tap root to enter, than can be found in this loose rich soil which rusts cotton. Hence on pulling up the plant which is much rusted, it will be found to have either no tap root at all, and to be supported entirely by lateral roots, which being small are very numerous—or the tap root, if it exists at all, is of a diminished size.

In coming to the conclusion that rust is produced by the too loose and porous state of the soil, arising as I think, out of the *chemical combination* of lime (in some form or other) and vegetable matter, when *both* of these substances are in excess, as compared with the other constituents of the soil, I am governed by the following facts.

1st. Excess of lime *alone*, cannot produce that loose soil which makes rust, because the greatest excess of lime is found on the summit of our open prairie hills, which are white and poor, but not as loose and porous as the blacker and richer land further down the hills, where the open prairie joins the "slues," or timbered land; and while the white and poor land on and near the summit, though producing smaller cotton, *does not* rust, the black, rich, and looser land, on the side of the hill, having less lime, but more vegetable matter, will certainly rust. The first, or white prairie, is the variety described in No. 20 of your analyses. For the first year or two, it produces very little; but after four or five years' cultivation, from the vegetable matter of the stalks left on it, and from exposure to the sun, it grows darker, and produces better. It is precisely like, and I think, nothing more than, the usual subsoil of prairie land, in high places showing itself on the surface. The black, loose, rusting land, where the open prairie, joins the woodland, is described in many specimens of your analyses, but is best described in Nos. 11 and 12, as the outskirts of the open prairie where it joins the hammock, (p. 332 vol. iii.) It is said in the statement of the analyses, that Nos. 11 and 12 contain no *carbonate* of lime; but I am convinced that they contain a large quantity of *lime*, in some form—or possibly magnesia. Those who are acquainted with prairies, can detect lime by the eye, but cannot determine whether it is *carbonate* of lime, or lime in some *other state*. The reason why I suppose that Nos. 11 and 12 have a great quantity of *lime* in *some state*, though not, as appears by your experiments, in the form of *carbonate* of lime, is, that I have seen such lands as they are described to be, and know, from the eye, that they have a large quantity of what is considered, by us, as lime, and besides, they are described as loose and porous; and every *other* experiment you recite, proves that these qualities of looseness and porosity are, on rich soils, in the precise ratio of the quantity of lime in them. From my acquaintance with the several specimens analyzed, by their description, except on the poor soils, and on Nos. 11 and 12, I should say that the measure of lime in them is an exact exponent of their looseness or want of adhessiveness; wherefore I conclude, if Nos. 11 and 12 have no carbonate of lime, they have a great quantity of the sulphate of lime, or lime in some other state—or otherwise, it *may* be magnesia.

* Published in vol. iii. Farmers' Register, pp. 321 to 336.

2d. Rust is not produced by excess of vegetable matter *alone*, because our wooded prairies generally, such as are described in Nos. 3, 4, 5, 6, 24, 27, 28, 32, 33, are as black and as rich, or richer, than any of our rusting open prairies, but are closer, firmer, and more adhesive, and hence never rust cotton. With a quantity of *vegetable matter* as great or greater than any of our prairie soils, these specimens have, without an exception, but a *comparatively small quantity of lime*. If they had a portion of *lime* sufficiently *great* to make, with the *vegetable matter* contained in them, a compound of *both lime and vegetable matter* which should *exceed* the other constituents of the soil, and particularly its clay, I have no doubt they would be as loose and porous as any prairie lands could be, and therefore would rust as much. As I said before, that excess of lime does not cause that *porous and finely granulated* state of the soil which rusts cotton, so these experiments warrant me in saying that no known quantity of *vegetable matter* will have that effect. Hence I am driven to the conclusion that large quantities *both of lime and vegetable matter are required* to form that *compound in excess* which destroys the adhesiveness of the soil, and consequently rusts cotton. I know of but one kind of wooded prairie which rusts cotton, and that, not as soon, or as much, as the open prairie. I allude to a black, rich, dry, porous and adhesive soil, resembling Nos. 11 and 12, and other specimens of rich, open prairie, but covered principally with a tree called *warwhoo*. I have no doubt this variety has, in addition to its rich supply of vegetable matter, more lime than most wooded prairie soils, and for that reason it is less adhesive. When this land has been cultivated a number of years, it becomes very loose and open, and cotton rusts in it to an injurious extent, but not as badly as in the open prairie. Post oak is an indication of much clay in prairie land, and hence when you find much post oak, you find a land stiff and adhesive, good for cotton, free from rust, but not as good for corn as looser and more friable land of the same fertility. No. 5 (p. 331 vol. iii.) is one of the best specimens of this kind of land, and though it has no *carbonate* of lime, I am sure it has *lime* in some other form, but the quantity is not large compared with the other ingredients, particularly vegetable matter and clay.

If, then, I am right in supposing that cotton never rusts from excess of lime singly, or from excess of vegetable matter singly, but does rust when both these ingredients are found *together* in excess, I come to the conclusion, that when lime and vegetable matter forms a union or chemical combination, which exceeds the other ingredients of the soil, and particularly the clay, the soil loses its adhesiveness, and assumes that loose and porous state which produces rust. Hence all prairie lands which rust, have a large portion of both lime and vegetable matter, and of course a diminished proportion of clay or sand; and as the surface washes away, until you reach the subsoil, the excess of lime and vegetable matter increases, and with it there is an increased liability to rust. When, however, the surface is entirely washed away, the subsoil, though with a greater excess of lime, having but little vegetable matter, produces very *small* cotton, but never *rusted* cotton. On the other hand, "hog-bed prairie," as it is called, No. 30, (p. 333, vol. iii.) though abounding in vegetable matter, having, evidently to the eye, but little lime, (eight per cent. by the analysis, and this is, I think, more than usual,) but a large quantity of clay, never was known to rust.

If my hypothesis is true, that the want of adhesiveness in the soil is the cause of rust, and that this is produced by the combined excess of vegetable matter and lime, the following remedies, for that disease in the soil, present themselves.

1st. Clay, to a *certainty*, would destroy this excess, and substitute in place of looseness and too great friability, that adhesiveness which the soil wants, to prevent rust.

2d. Sand would also destroy this excess, and might (though I speak doubtingly,) give more closeness and compactness to the soil, and thereby prevent rust. It is used for opposite purposes on all other soils; but the sandiest soil is not so loose, light, and porous as the rusting prairie soil. Nothing but a bed of new ashes can compare with it. Besides, the sandiest pine wood soils are not so porous and open as to rust cotton; but on the other hand, light sandy "isinglass" lands on the rivers, worn out, are subject to rust, though not to the extent of prairie lands. They are, however, lighter and looser than *other sandy* lands, either on account of the isinglass, [mica,] or the presence of a large portion of calcareous earth. These opposing facts cause me to speak doubtingly of the effect of sand, although I am informed that the best prairie lands, for cotton, in Texas and some parts of Mississippi, have a much greater proportion of sand in them, than is to be found in the prairies of Alabama. The best cotton lands with us, are stiff lands, where clay predominates.*

If these two processes, or either of them, would prevent the rust, it is obvious they would at the same time impoverish the land, by lessening the relative amount of vegetable matter in the soil;† and in any event would be attended with great expense, as clay is no where to be found in the prairies, except in combinations of from sixty to eighty per cent. with lime, and sand is very scarce. In boring for wells, to the depth of hundreds of feet, the quantity of lime mixed with the clay does not diminish.

The question then presents itself, whether it is practicable, by animal or vegetable manure, to lessen the excess, or to neutralize the lime, so as to prevent that chemical union or combination which I have supposed to exist only when *both* these ingredients are in very large quantities? In other words, can the addition of vegetable matter

* We have no doubt but that in such soils, containing very little silicious earth, and yet very light from great superabundance of calcareous earth, an application of sand would stiffen the soil.—Ed. Far. Reg.

† The addition of barren sand would not *impoverish*, but *enrich* (or manure) the soil—or at least serve to increase its productive power. Though the vegetable or putrescent matter in soil is all that feeds plants, and therefore alone gives, *directly*, fertility to soils, still when in excess, the superabundant part is injurious to the crop, and its abatement, or being balanced by a barren but necessary earth, would be indirectly giving more productive powers, or richness to the soil. —Ed. Far. Reg.

reduce this excessively calcareous soil to what you call a rich "neutral soil?" Your analyses favor this opinion. Among the best soils for cotton, described in those numbers, few of them have any carbonate of lime; and none of them a large portion. I have no doubt, however, that in those having no *carbonate* of lime, there is lime in some other form, but perhaps, to use your idea, "neutralized." Nos. 4, 5, 6, 8, 29, and 31, have no carbonate of lime, and I have no doubt, with the exception of No. 22, are the best cotton lands described. No. 3, is doubtless good, but has too much carbonate of lime. The same may be said of No. 17. No. 19, good, but has lime in excess; the same remark of No. 24. No. 27, though *slue* or wooded prairie, approaches, I should suppose, to the character of warwhoo land, before described, and would not always be proof against rust. No. 28, I imagine, is of the same character.

I may here remark, that land which is light and loose, comparatively, though not enough so to rust cotton, produces very large stalks, but never bolls as well, as closer and stiffer soils. Hence post oak lands, which are always stiff, from a redundancy of clay, is proverbial for not very large, but very heavy bolled cotton; and besides its exemption from rust, is less liable to other casualties, and is considered more "certain for a crop." This fact explains my qualification of praise as to No. 3, No. 17, No. 19, and No. 24, though probably none of these lands have enough lime in them to make them sufficiently loose and porous to rust cotton. I am convinced, however, that by having more lime than they ought to have, they are not so close and adhesive as to produce as well as Nos. 4, 5, 6, 8, 29, and 31.

I am so well acquainted with the soils described, that, from the description given, I can form a very good idea of what they are. In fact, I am acquainted with some of the lands from which the specimens have been taken.

Upon the effect of manure in preventing rust, experiments have as yet been so partial, that opinion is very much divided. In the first two years of cultivating open prairie, before the grass roots and other vegetable matter are rotted and destroyed, rust scarcely shows itself. The same land, when it becomes older, and before its fertility is impaired, judging by the corn crops, will rust badly. Many have thought from this, that by sowing small grain, and leaving long stubble, the rust would be prevented; but so far as I know, this has, strange as it may appear, increased the disease. Others have manured lightly with cotton seed, and some have bedded their corn and cotton stalks in the ridge upon which they planted cotton. The success that has followed these two courses, is differently estimated by different individuals; and many think, though I differ with them, that the labor is thrown away. The effect is, however, not decisive. I have understood that stable manure has, with one gentleman, completely cured the worst forms of the disease.

From these facts I should infer that if manure is to do any good, it must be in quantities large enough to lessen or neutralize the lime, and I think the best form in which it can be applied, will be in clover, sown and then turned under. The experiments with clover have been few; but in one instance, I have been informed, it was sown on prairie land in Lowndes county, that it grew very large, and that it continued a good crop through three seasons. Our climate has been considered too warm for this plant; but this experiment shows that soil has much more influence than climate, and, I think, promises a cure for the rust. At any rate, the experiment is worth repeating.*

I fear I have tried your patience, by this long and undigested scrawl, in support of a theory as as to the cause and prevention of rust in cotton. The man, however, who succeeds in finding a remedy for this disease, will confer on the prairie region of the south-west, a public benefit, equaled only by that conferred on the people of eastern Virginia, by your Essay and experiments on the use of calcareous manures. I have written much more than I intended when I sat down, and must ask your indulgence for the hasty and very imperfect manner in which I have presented those crude reflections, which have sprung up in my mind, since reading the "Essay on the formation of Prairies," which you were so kind as to send me. You are at liberty to publish any portion, if you think any of my facts or opinions are worthy of notice. If not, I shall feel no mortification, that reflections which have travelled only with my pen, should be withheld. In any event, I shall, when I reach home, bestow some attention on the subject, and give you the result of better digested opinions.

If you can send me one other of your Essays on Calcareous Manures, and as many of the sheets containing the theory of the formation of prairies as you can spare, I will be greatly obliged to you, and will remit you their price, by being informed of the same. I wish to put them in the hands of a few intelligent friends in Alabama, and in so doing, I hope to confer a benefit on the agriculture of that fine state. I may perhaps send you some further specimens of Lowndes county soil, for analysis, as there are some varieties, which if analyzed would throw additional light on the subject of this letter.

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MEANS OF GUARDING AGAINST THE RAVAGES OF BLACK WEEVIL.

To the Editor of the Farmers' Register.

Person Co. N. C. Feb. 1st, 1837.

Mr. Editor:—Having perused your Register from the commencement of your fourth volume

* This report of the success of clover on calcareous lands in Alabama, is highly gratifying, and accords well with the views we have elsewhere expressed. But a few years ago, it was a universal belief that even the climate of lower Virginia was quite too hot for clover culture to succeed. Now, it is established that marl or lime will make our worst soils fit for clover, and generally, also for the further improvement of gypsum; and that where the soil is thus fitted for clover, the climate ceases to be found unfriendly. We doubt not that the cultivators of the prairie lands of the south and west, may gain (or save) the value of many millions of dollars, by the yet untried use of clover, and by otherwise treating properly their calcareous soils, as required by their peculiar properties.—Ed.

up to the present time, and having never seen any remedy for or against the black weevil, which has proved so destructive to the wheat crops after they have been housed or garnered, in this section of country, and I suppose generally through the whole of the wheat growing countries, I would state for the benefit of those whom it may concern, that I have found out a sure remedy, so far as my experience has gone, (say for the last five or six years,) which is simply this: Take, I would say, one sack of Liverpool blown salt, and have it properly mixed with one thousand bushels of wheat; or a half bushel of salt will be a sufficient quantity for one hundred bushels, if well intermixed. Since I fell upon this plan, I have not seen a black weevil in my crop of wheat, or houses where it is stowed away, although kept until it was very old. Before using the salt among my wheat, it was very often cut to pieces and spoiled, by the weevil, so that it was neither fit for bread nor market. I think the rice dealers or planters would do well to try the remedy, as well as the wheat growers, &c. I do not consider that any person would ever find their wheat or rice the worse, or injured with so small a quantity of salt to such a large bulk of wheat or rice. In fact, it is not to be perceived in the wheat or flour, either as it respects flavor or taste. If you think the above of any service to the public, or worthy of a place in your Register, you are at liberty to publish it with my own proper name.

JOHN P. WEBB.

For the Farmers' Register.

SUBSTITUTE FOR HOP YEAST.

Take of wheat bran one quart—water, three quarts—two or three sprigs of common horehound—boil down to one quart—strain, bottle and sweeten in the usual way, and you have a fine yeast.

As I put but little confidence in recipes not authenticated by the proper name of the giver, I send mine, with the assurance that delightful loaf bread, made with this yeast, was used in my family more than a month or two.

S. G. T. COULTER.

New Kent.

From the Gardener's Magazine.

PROPAGATING THE PEACH.

1st. We gather the stones in the fall, which we bury about an inch under ground, (high and early ground is preferred, as the pits will sprout earlier in the spring,) spreading them singly, but as closely as you can, in order that the frost may have its full effect upon them. The best time for putting them in the ground, is the last of October, but any time in October or November will do.

2d. *Preparing the ground for the young trees.*—Select a rich and middling dry piece of ground, which, if very rich, will do without manuring, but if not, manuring is indispensable. Short and old manure is the best, and if some rich dirt be mixed therewith, I think all the better. The manure should be spread along the furrows, which should be made with a plough, four feet apart. If any other manure be added after, I would recommend lime or ashes. The ground should be ploughed as well as harrowed well, in the first place.

3d. *Transplanting.*—This should be done as soon as the pits begin to sprout in the spring, by dropping them in the rows already prepared for them, about eight or nine inches apart, and covered about an inch or more deep. Some nurserymen let the young sprouts grow six or eight inches high before they transplant them, but the former way, I think, the best. The young trees should be planted and hoed as often as necessary, in order to keep them free from weeds and grass, say three or four times each, the last just before budding, and not afterwards that season.

4th. *Budding.*—Select from the healthiest trees the scions of the kinds you wish to propagate, cut off the leaves and keep them in water, at least, the butt ends, (those buds which have three leaves on, are the best.) They may be kept in this manner three or four days. Then take the scion in your left hand, holding the butt end downwards, enter your knife about half an inch below the bud, and cut upwards about a quarter of an inch above the bud, taking the wood with it, and then cut across the twig deep enough for the bud to come off; then with the point of your knife take out the wood from the bud; then make a transverse cut in the stock to be budded, about three or four inches above the ground, (first trimming off the leaves and limbs about six inches above the ground;) from the middle of this cut, make a slit about half an inch downwards, then, with the point of your knife, open the bark on each side of the slit, by the transverse cut; enter the lower end of the bud therein, bearing it down with your thumb and finger, till the top side of the bud comes just below the first transverse cut; then with bark or yarn, wind above and below the bud, in order to keep close to the wood. In twelve or fourteen days, the bandages may be removed. The time of budding may be from the 20th of August to the 20th of September, perhaps later sometimes. In the following spring, when the buds grow three or four inches long, the old stalk should be cut off about an inch above the bud. In the following fall or spring, you may set out your orchard, putting the trees about twenty feet apart. The ground should be rich and dry—not springy. Manuring is indispensable, unless the ground be very rich. Corn or potatoes may be planted among the trees, with benefit to them for three or four years.

BEET SUGAR.

Notice has been officially given in the New York papers, that an application will be made to the legislature, at the next session, for an act of incorporation for a company for the manufacture of sugar from the beet root, with a capital of $500,000.

From the Genesee Farmer.

COMPARATIVE WEIGHTS OF GREEN AND DRY GRASSES.

A great number of accurate experiments show that on an average—

100 lbs.	green	red clover	makes	27	lbs.	of hay.
100 "	"	herds grass	"	40	"	"
100 "	"	fresh meadow	"	38	"	"
100 "	"	salt grass	"	39	"	"
100 "	"	rowen or 2d crop	"	19	"	"
100 "	"	corn stalks	"	25	"	dry stalks.

From the British Quarterly Journal of Agriculture.

ON THE SPECIES AND VARIETIES OF DOMESTIC FOWLS.

The varieties in the sizes, forms, and colors, of our domestic fowls, are sufficiently striking to attract the notice of the most indifferent observer; while, to those who can find subjects of reflection in every production of nature, they may be made an ample source of interesting remark, as well as of amusing experiment. "If people," says M. Reaumur, "are affected with the kind of pleasure so transitory to the most enthusiastic florists, who procure it but for a few days by a world of care and toil continued through a whole year—if they are affected by the variety and fine combination of colors in their favorite flowers, the poultry-yard, when well managed, may be made to offer them endless pleasures of the same description."

The greater number of cocks, even those of the commonest breeds, when exposed to the play of the sun's rays, exhibit the brightest colors; and with the glossy brilliancy, beauty, and varied mixture, we are the more struck in proportion to our minute observation of them. The hens, on the other hand, if the breeds have been select, are often no less worthy of admiration. Some, for instance, have spots distributed with great regularity, and so brightly white as to look silvery; others are termed golden, because they are spotted or speckled with a fine golden orange color; while the more common colors are varied in a manner almost endless—and, upon the whole, domestic fowls offer a multitude of colors, the several shades of which would be found with difficulty, if they were sought for among the birds of the woods or the waters.

It is no less worthy of notice, with regard to colors, that, among the fowls in a poultry-yard, they not unfrequently change in a surprising manner from the time when the chicks cast their down, to the annual moult of the full-grown fowls. It is no doubt the regular process, at least after the second and following moults, for the colors to continue much the same. I have at present a hen of the Spanish breed, which has been of a uniform black for two successive moults, but has now her neck, wings, and tail-feathers, tipped with pure white. I have another which was all over of silver-grey color, but has now her head and neck coal-black, with a ring of fine white at the base of the neck, while the rest of the body is finely speckled with black and snow-white. It is remarkable also, that this change took place in a few weeks, without any obvious moult, so as to cause her to appear anywhere bare of feathers.

M. Reaumur tells us, that in one of his hens which his poultry-woman distinguished from the rest by a crooked claw, when her coat began to be taken notice of, had feathers of the ruddy color, mixed with brown, so common among dunghill fowls. A year after, this hen was observed to become almost black, with here and there some large white spots. After the second moulting, black was the predominent color on every part of the body; but, strange to tell, upon the succeeding moult, white was the predominant color, and only a few black patches about the size of a half-crown piece could be observed. Upon the succeeding moult, all the black spots disappeared, and the hen became uniformly of a pure white like that of a swan. As she was at this time old for a fowl, that is, not less than ten years, it might be thought that old age, which whitens the human hair, likewise whitens the feathers of certain birds; but, in that case, M. Reaumur says the transition from the ruddy to the white ought not to have been made, as it really was, through the black, and was of opinion, as the hen was still vigorous and healthy, that she might again change her color, if she lived, to brown or black.

A cock which was observed also by M. Reaumur more carefully than the hen just mentioned, afforded him some proofs that the white color of the feathers was not, at least in that instance, caused by age. The owner of the cock was struck the first time he moulted with the singular change in his color, and, for five successive moults, there was always a considerable change of color. In his first year, he had some of the ruddy brown, mixed with white, so common in dunghill cocks; in the second, he was all over ruddy brown, or rather red, without any white; in the third he became uniformly black; in the fourth uniformly white; and in the fifth, when he was presented by the Prior of Bury to M. Reaumur as a curiosity, he had white feathers mixed with a good deal of ruddy color and brown, bordering upon chestnut, his neck, back, wings and belly being ruddy, and even where there were white feathers, they were mingled with ruddy ones. During the vacation, M. Reaumur was two months without seeing him, but, in this period, he became so changed as not to be recognizable, his feathers having become all over of the finest white. The following year he had partly white feathers, but the greater portion was ruddy, or rather of a fair red. Here, then, was a re-transition from white to a light brown, indicating that the whiteness of his feathers was not owing to the number of his years.

Such is a very small specimen of the interesting observations which might be made in the poultry-yard by those who choose to direct their attention to the changes continually occurring there. In order, however, to lay some foundation for similar inquiries, and what may be deemed of still greater importance by most of the readers of this journal, the comparative value, in an economical point of view, of different sorts of fowls, I shall here attempt a sketch of the several species and varieties, as described by naturalists and practical writers; and, with these views, it may be advisable to begin with the wild species, natives of the warm climates of the east, supposed to be the origin of the tame varieties. Of the wild there are only two species.

1. *Java Cock.*

CHAR. SPEC.—Gallus Bankiva, *Temminck*. *Male:* Comb toothed compressed; wattled under the mouth; tail somewhat sharpened at the top, and sub-horizontal; feathers of the neck elongated, rounded at the top; head and back fawn-colored; wing-coverts brown and black; belly and tail black. *Female* brownish-grey and golden yellow; comb and wattles less than in the male. Inhabits Java. Comb and wattles ruddy; feet ash-grey.

Description.—This bird is indigenous to the Island of Java, and is specifically distinguished by a red indented comb, red wattles, and cinereous legs and feet. The male has a thin indented or

scalloped comb, a sort of beard depending from the under mandible, the tail a little elevated above the level of the rump, and the feathers somewhat imbricated. The feathers of the neck or hackles are long, pendant, and rounded at the tips, and of the finest golden red; the head and back are fawn-colored; the wing-coverts are dusky, brownish, and black; and the tail and belly are black.

The female is of a dusky ash-grey and yellowish color, and has her comb and the beard under the mandible much smaller than the cock, with no feathers on the neck besides the long hackles.

M. Leschenault brought specimens of these birds, male and female, from the Island of Java, and deposited them in the museum at Paris. According to M. Temminck, they inhabit the forests and the borders of woods, and are exceedingly wild and shy. On examining this species, it will be found to exhibit many points of resemblance with our own barn-door fowls of the middle size, the form and color being the same, the comb and wattles similar; while the hen so much resembles a common hen, that it is difficult to distinguish it, except by the less erect slant of the tail. The rise of the tail is much more apparent in the cock; but it may be observed, that in all the wild species known, the tail does not rise so high above the level of the rump, nor is it so abundantly provided with covering feathers as in some breeds. It may be that the superabundance of nourishment, and the assiduous care of man, have contributed to the greatest developement of all their organs. Various tame breeds, indeed, such as the tufted, the Hamburgh, the double-combed varieties. and others, shew that domestication produces infinite varieties.

The Java cock very much resembles, both in form and color, the tame Turkish and Bantam varieties of the barn-door fowl; but the tail differs in being nearly horizontal and vaulted in the Java species, while in others it is more raised, and forms two upright planes, meeting above and diverging below. The hackles, or feathers which fall from the neck over the top of the back, are, as in the tame barn-door varieties, long, with divided plumelets or beards, the feather widening a little, and being rounded. The plumage is decorated with exceedingly brilliant colors. The head, the neck, and all the long feathers of the back, which hang over the rump, are of a shining flame-colored orange; the top of the back, the small and middle coverts of the wings, are of a fine maroon-purple; the greater wing-coverts are black, tinged with iridescent green; the quill-feathers of the wings are ferruginous red on the outer, and black on the inner edges; the breast, belly, thighs, and tail are black, tinged with iridescent green; the comb, cheeks, throat, and wattles, are of a more or less vivid red; the legs and feet are grey, and furnished with strong spurs; the iris of the eye is yellow.

The female is smaller than the male, and her tail also is a little horizontal and vaulted; she has a small comb and very short wattles; the space round the eyes is naked, as well as the throat; and, on this space, are some small feathers, distant from each other, through which the red skin can be seen; the breast and belly are light-grey or fawn-colored; on each feather is a small clear ray along the side of the mid-rib or stem; the feathers of the base of the neck are long, with disunited beards or plumelets of a black color in the middle, and fringed with ochre-yellow; the back, the coverts, the wings, the rump, and the tail, are earthy-grey, marked with numerous black zig-zags; the large feathers of the wings are cinereous-grey.

The reason which M. Temminck gives for believing that the Java cock is the wild stock of our domestic breed, or from which it derives at least its main origin, are, the close resemblance of their females to many of our tame hens; the nature of the feathers, and the forms and distribution of the barbs, which are absolutely the same in many of our tame cocks; and because it is in this species alone that the females are furnished with a comb and small wattles, characters not to be found in any other known wild species.

Another wild species, the jungle cock, has been maintained by Count Buffon and others to be the origin of our domestic breeds; but it will be evident from the following description that this opinion is erroneous.

2. *Jungle Cock.*

CHAR. SPEC.—Gallus Sonneratii, *Temm. Male:* Comb toothed, compressed; throat wattled beneath; ears naked; tail compressed and ascending; feathers of the neck cartilaginous, spotted, with yellow cartilaginous tips; wing-coverts reddish-chestnut, with the top enlarged, cartilaginous, fulvous: breast somewhat red: body varied with grey, white, and red; tail-feathers shining violet. *Female* less in size, and without comb and wattles; head feathered; body variegated with dull brown and red. Phasianus Gallus, *Lath.* Ind. Ord. ii. 625. *Gmel.* Syst. Nat. i. 737, sp. 1. *Linn.* Faun. Suec. No. 19.—Le Coq Sauvage, *Sonnerat.* Voy. Ind. ii. 153, tab. 94, male; and 160, tab. 95, fem. *Buff.* par *Sonnini*, v. 206, pl. 37, fig. 1 & 2. *Bonat.* Tab. Encl. Orn. 180, pl. 86, fig. 5. Coq et Poule, *Sonnerat, Temm.* Pig. et Gallin. ii. 246, Tab. Anat. iii. fig. 1 & 2, a feather of the neck and one of the wing-coverts.—Wild Cock, *Lath.* Synop. iv. 698.—Inhabits India: Length 3 feet 4 inches; comb and wattles red; feet armed with great crooked spurs.

Description.—The jungle-cock measures three feet four inches in length, and inhabits the great forests of India, continues to reproduce there in the wild state, and is clearly distinct from the domestic varieties reared in the same countries by the Hindoos, these resembling, in all respects, the tame breed of fowls in all other quarters of the globe. M. Sonnerat, however, thought very differently, and prided himself much on his supposed discovery of this as the origin of our common fowls, rejecting the statements of Dampier and others as to the existence of wild fowls, probably the Java species, in Timor, and other islands of the Indian seas.

The present species is one-third less in size than our dunghill cock, and, from the level of the feet to the summit of the head, the comb not being included, it measures 14½ inches; the comb is indented; the wattles resemble those of our dunghill cock, but the naked parts of the throat and head are more considerable. The feathers of the head and neck are longest on the lower parts, and their form and structure are different from those of the same parts in other cocks, whether wild or tame. The midrib or stem of these feathers is gross, and considerably expanded, forming a white stripe

along the whole feathers, as far as the tip, where it becomes broader, and gives rise to a sort of gristly plate, of a rounded form, whitish, thin, and very polished. This gristly substance is found still more obvious on the wings. The tip, indeed, of all the wing-feathers forms a broad gristly plate, whose substance is solid, and very thick to the touch, though as shining and polished as in the feathers of the neck. These gristly plates are of a deep red color, and form by their union a plate of a red maroon, which looks as if it were varnished.

The jungle-hen is smaller than the cock, has neither comb nor wattles, and the throat is covered with feathers, a very marked distinction from our domestic hens. The space around the eyes is naked, and of a reddish color. All the plumage of the under parts is similar to that of the cock, but by no means so bright. She has not the long feathers at the nape of the neck, nor the thin gristly plates at the tips of the feathers. The whole of the upper parts are more or less blackish-grey, with white rays occupying the middle of the feather, and following the direction of its mid-rib.

The jungle-cock, in a word, seems to be as different from any known variety of our tame fowls, as a hare is from a rabbit, or a goat from a sheep; and the fact, that the jungle-cock is not domesticated in its native country of India, while our dunghill fowls are common there, seems to be decisive against the opinions of M. Sonnerat and Count Buffon.

Of the domestic species there are the following:—

3. *Domestic Cock.*

Char. Spec.—Gallus Bankiva (A.) domesticus, *Temminck. Male:* comb toothed, compressed; throat wattled beneath; tail compressed, ascending: feathers of the neck long and narrow, variegated with fine colors. *Female:* comb and wattles less than in the male.—Gallus domesticus et gallina, *Brisson*, Orn. i. 166; *Idem*, 8vo. p. 45; *Raii*, Synop. 51, A.; *Will.* 109, tab. 26; *Schaef.* El. Orn. tab. 38; *Rom.* Orn. i. 56, tab. 9, and p. 59, tab. 7; Storia degli Uccelli, ii. tab. 207 and 208; *Frisch.* tab. 127—129. Phasianus gallus domesticus, *Lath.* Ind. Orn. ii. 626, B.; *Linn.* Syst. Nat. i. 270; *Gmel.* Syst. Nat. i. 737, sp. 1, B.; *Retz. Linn.* Faun. Seuc. 206; *Borowsk.* Nat. ii. 177, Alector; *Klein*, Aves, 111, A. 1; *Idem*, Ov. 31, tab, 13, fig. 1.—Coq commun à Crete ou Coq villageois, *Buffon*, ii. 116, tab. 2; *Idem*, Pl. Enlum. i.; *Idem* par *Sonnini*, v. 104, tab. 35 fig, 1; Bonat, Tab. Encycl. Orn. 181, pl. 87, fig. 1; *Gmel.* Trad. Franç. ii. 407, var. b.; *Temm.* Pig. et Gallin. ii. 92, and Tab. Anat. ii. figs. 2, 3, 4, and 5; *Idem*, Tab. Annat. iii. figs 3 and 4, a feather of the neck and one of the wing-coverts. Domestic Cock, *Albin.* Birds, iii. tab. 32; *Brown*, Jam. 470; *Sloan*, Jam. ii. 301, Phil. Trans. xii, 923; *Lath*, Gen. Syn. iv. 700.—Das gemeine Kamm oder Haushuhn, *Bechstein.* Natur. Deutschl. iii. 1212, tab. 44. (*a.*) Das Huhn mit dem kleine Kamme; (*b.*) Das Kronenhuhn; (*c.*) Das silberfarbige Huhn; (*d.*) Das schieferblaue Huhn; (*e.*) Das chamoisfarbige Huhn; (*f.*) Das geschupfte oder hermelinartige Huhn; (*g.*) Die Wittwe; (*h.*) Das feuerfarbige und steinfarbige Huhn, *Bechst.*—Gallo commune, Storia degli Uccelli, ii. pl. 207, pl. 211 and 213. Horned individuals.

Description.—The domestic cock is characteristically distinguished by a thin indented or scalloped comb, with wattles on each side under the beak; by the tail rising in an arch above the level of the rump; by the feathers of the neck being long and line-like; and by the colors being finely variegated.

The female has the comb and wattles smaller than those of the cock, is smaller in size, and has the colors more dull and sombre.

The influence of domestication in our tame breeds of this species, having produced alterations in the entire forms of the body and of the comb and wattles, it is difficult to indicate the races which owe their origin to the same stock or source; but those races most approaching the primitive species (*G. Bankiva*) have undergone the fewest changes from taming, and have produced by interalliance the breed of dunghill fowls, with comb and wattles—the breed of tufted fowls, with small comb and wattles, in which those juices proper to form these parts have been, it would appear, expended in the production of the tuft of feathers which ornament the head;—all those breeds of fowls whose legs and feet are more or less covered with feathers, the origin of which may be attributed to superabundance of nutriment that has in this instance produced feathers on the legs, as it has formed a tuft on the head in the tufted fowl; the race of Hamburgh cocks which have the head hooded, and the feathers stretched back over the ears.

Exclusive of the more marked breeds to be afterwards noticed in detail, Dr. Bechstein, as we have seen in the synonymes, has distinguished eight varieties of the common domestic fowl, namely, the fowl with a small comb; the crowned fowl; the silver-colored fowl; the slate-blue fowl; the chamois-colored fowl; the ermine-like fowl; the widow, which has white tear-like spots on a darker ground; and the fire and stone colored fowl. It is, however, difficult in many cases to identify the distinctions made by foreign writers, with the fowls bred in this country. I shall class the varieties therefore, as distinctly as I am able, and will be glad to be corrected where I may fall into mistake.

4. *Dunghill Cock.*

The sort usually called the dunghill breed is a mongrel arising from crosses of all kinds of varieties, and consequently not distinguishable by any peculiar mark, but partaking more or less of the form and qualities of the parent birds. The varieties in most esteem are of middle size, with dark colors, and white, not yellow legs. Light colored or white bodies are more tender of constitution, and are said by some not to be good layers, though this does not always hold. White chickens are the best to fatten for the table.

5. *Game Cock.*

The game cock is the variety termed the English cock by Count Buffon and the French writers. It is more slender, both in the body, the neck, the bill, and the legs, than the other sorts, and the colors, particularly in the male, are in most cases very bright and showy. Even of the game cock, however, there are many varieties, some of which are more celebrated than others, among amateurs and feeders. Amongst these Sketchly mentions the black-breasted red, which, when true bred, is

of a clear vivid dark red, without any shade of black whatever from the back to the extremities; the upper convex side of the wings equally red and black, even those feathers surrounding the posteriors; the whole tail-feathers black as well as the top of the wings; the beak and legs also black. The female is of a dark partridge color, with bright red hackles above, black beneath, the breast of a clear brick-red, and the beak and feet black.

The flesh of the game breed is white, tender, and delicate, and on this account marketable; but the propensity to fight is so strong among the chickens, that they often injure or kill one another, and hence it is difficult to rear them in numbers. The eggs are but small in size, but, like the flesh, they are much esteemed for their superior delicacy.

6. *Dorking Cock.*

CHAR. SPEC.—Gallus Bankiva (*E*) pentadactylus. *Temminck,—Male and female* with five toes on each foot. Gallus pentadactylus, *Brisson*, Orn. i. 169; *Idem*, 8vo. i. 46; *Frisch*, Tab. 127, and 128: *Rom.* Orn. 62—Le Coq et la Poule à cinq doigts, *Buffon*, Ois. ii, 124; *Sonnini*, v. 190; *Gmel* Trad. Franç. ii. 408; *Bonnat.* Tab. Enc. Orn. 182, c.—Dorking Cock, *Latham*, Synop. iv. 703; Das funfzehiger Huhn, *Bechst*, Nat. Deutsch. iii, 1295.—(*a*) Das sechzehige Huhn; (*b*) Die Spornhenne, *Bechst.*; this variety is crossed from others, and differs only in the number of its toes, *Temm.* Pig. et Gallin. iii. 659.

Description.—Nobody can doubt that the production of two hind toes instead of one is merely accidental, like that of two thumbs on each hand sometimes observed to run in particular families of the human race; but double hind claws are certainly not peculiar to the fowls bred about Dorking in Surry, for five-toed fowls are mentioned by Aristotle in Greece, by Pliny and Columella in Rome, and by Aldrovand in Italy, hundreds of years ago, the breed then as now being reputed good layers. Dr. Brechstein mentions a variety variety with six toes, and another in which the female is furnished with spurs. The writer of the article "Poultry" in *Rees's* Cyclopædia, seemingly on the best information, says it is quite a mistake to suppose that the Dorking breed of fowls have uniformly five toes; but they are of a larger size than the ordinary dunghill fowls, the body long and the eggs large. The flesh is rather yellow than white, and requires to be improved by castration. It is not improbable that this large breed is a cross between the Malay or Shackback and the game variety. The colors are as variable as those of the dunghill fowl, but about Dorking, white is most prevalent, and many esteem a white color to be no less essential to the genuine breed, than the supernumerary hind claw.

7. *Poland Cock.*

CHAR. SPEC.—Gallus giganteus, *Temminck.* Male and female . . . . Coq Jago, *Marsd.* Voy. à Sumatra, Trad. Franç.; *Temm.* Pig. et Gallin. ii. 84, et Tab. Anat. 2 fig. 1. The foot of the natural size —Inhabits Java and Sumatra; is twice as large as the common cock; comb and wattles bright red.—(*A.*) Patavinus. Comb toothed, variegated with beautiful colors. Gallus Patavinus, *Brisson*, Orn. i. 170; *Idem*, 8vo, i. 46: *Aldrovand.* Av. ii. 310 and 311, Tab; *Rom.* Orn. Tab. 8 and 9, 63. Storia degli Uccelli. ii. pl. 200 and 211.—Le Coq de Caux ou de Padoue, et les Poules de Sansevarre; *Brisson*, Orn. ii. 125; *Gmel.* Trad. Franç. ii. 409; *Tem.* Pig. et Gallin. ii. 86·—Das Paduanische Huhn, *Bechst.* Nat. Deutschs. iii. 1293.—Paduan Cock, *Latham*, Synop. iv. 707. Size agrees with the *Gallo giganteo*, and twice the size of the common cock. *Temm.* ut supra, iii. 654.

Description.—The original of this fine breed is supposed by Temminck to be the wild species described by Marsden as a native of Java and Sumatra, and termed by him the Jago cock, though little more is known of the wild sort than that it is double the size of the Java cock, (*G. Bankiva,*) or of our dunghill variety. Marsden says he has seen in the east a cock of this species, tall enough to pick crumbs from a dining table. They are said to weigh from eight to ten pounds. The comb both of the cock and the hen are large, frequently double, of the form of a crown, with a tufted crest of feathers, often largest in the hen. The voice is stronger and harsher than that of other fowls; but the most singular peculiarity is, that they do not come into full feather till about half grown.

It is now about two hundred years ago, since the Italian naturalist, Aldrovand, says of the Paduan breed, that the cock is very handsome, being adorned with five colors, namely, black, white, green, red and yellow; that the whole body is black, but the neck is clothed with very white feathers, the wings and back being black, tinged with green, the tail of the same color, with the base of the feathers white; that the head is adorned with a tufted crest of a black color, but having the base of the feathers white; that the eyes are surrounded with a red spot; that the comb is small, and the beak and feet are yellow.

The hen is all over black, tinged with green, except the small pellicle near the ears, which is white. They produce very large eggs.

8. *Crested Cock.*

CHAR. SPEC.—Gallus Bankiva (B.) cristatus, *Temminck.* Crested on the top of the head with thick feathers, variegated with fair colors. Gallus cristatus et Gallina cristata, *Brisson*, Orn. i. 169; *Raii*, Synop. 51. A. i; *Aldorv.* Av. ii. 307, var. albo.—Phasianus cristatus, *Lath*, Ind. Orn, ii. 626, var. y; *Linn.* Syst. Nat. i. 270, B; *Gmel.* Syst. Nat. i. 738; *Retz*, Faun. Suec. 206, No. 182; *Borowsk*, Nat. ii. 178, a; *Rom.* Orn. i. 60. Le Coq huppé et de Hambourg, *Buffon*, Ois. ii. 116; *Idem*, Pl. Enlum. 49; *Sonnini*, v. 179, Tab. 36; *Bonat.* Tab. Enc. Orn. 182; *Gmel.* Trad. Franc. ii. 408, var. a; *Temm.* Pig. et Gallin. ii. 239.—Crested Cock. *Lath.* Synops. iv. 703.—Das hanben Huhn, *Bechst.* Nat. Deut. iii. 1283.—(*a*) Das Huhn weissee mit schwartzes Federbusch; (*b.*) Das schwartze Huhn mit weissem Federbusch; (*c*) Das weisse Huhn mit dem grossem Barte, *Bechst;* agrees with other kinds except in the feathered crest. *Temm.* ut supra, iii. 556.

Description.—This variety is distinguished by a densely tufted crest, while the comb is small, and by being variegated with fine colors, while in all other respects it agrees with the common dunghill breed. Dr. Bechstein mentions, as we have seen in the synonymes, the following varieties, namely, white with a black crest; black with a white crest; and the white fowl with a large beard.

The breed of crested fowls is much esteemed by the curious, and is bred with great care. Those who are desirous of propagating any singular varieties, separate and confine the individuals, and do not suffer them to mingle with such as have the colors different. Those varieties are more esteemed in proportion as the colors are more rare, or as the tuft of the crest contrasts with the rest of the plumage; but, though the differences of plumage may thus be preserved pretty constant, they seem to owe their origin to the same breed, and cannot be reproduced pure without careful superintendence. These cocks are much esteemed in Egypt, in consequence of the excellence of their flesh, and are so common that they are sold for the value of twopence or three halfpence each. They are equally abundant at the Cape of Good Hope, where their legs also are feathered. Some travellers assert that the Mexican poultry are crested, but these, as well as all the rest on the continent of America, have been introduced from the old world.

There can be little doubt that all the varieties of crested fowls have originated from the intercrossing of uncrested breeds with the Poland and or Paduan.

9. *Hamburgh Cock.*

Das Hamburgischehuhn, *Bechstein.*

This is a variety of the preceding, distinguished by the thighs and belly being of a velvety-black color. The deportment of this breed is grave and stately; its iris is yellow; and its eyes are encircled with a ring of brown feathers, from which arises a black tuft that covers the ears. There are other feathers nearly like those behind the comb and beneath the wattles, and broad round black spots on the breast. The legs and feet are of a lead color, excepting the sole of the foot which is yellowish.

10. *Spanish Cock.*

This is a large breed, in which the prevailing color is black, with irridescent green, while the combs and wattles even of the females are more than usually large, the top of the comb for the most part flapping over on one side. The caps of the ears are large, and of a bluish-white color. It is evidently of a variety of the Poland, in which the nourishment expended in that to form a crest of feathers, goes to enlarge the combs and wattles. The Spanish hens lay very large eggs, and, like the Poland, is esteemed for fine flesh.

11. *Malay or Chittagong Cock.*

This is similar in size to the Spanish, differing in the color, not being so uniformly black, but brown streaked with yellow. The hens are said to be good layers, and the eggs are large, but their flesh is coarse in the fibre, and of a dark color. Hybrids between the dunghill breed and the common pheasant are sometimes also termed Malays.

12. *Bantam Cock.*

Char. Spec.—Gallus Bankiva (G.) pusillus, *Temminck.* Male and female variegated with elegant colors; comb toothed, compressed. In all respects agrees with the common Bankiva Cock.—Gallus Branticus, *Brisson*, Orn. i 172, var. b. *Idem*, 8vo, i. 47.—Gallus plumipes, *Rom.* Orn. 61; *Brisson*, Orn. i. 172, var. a; *Idem.* 8vo, i. 47. Gallus et Gallina minor, *Frisch*, Tab. 136 and 137.—Phasianus Gallus pusillus et plumipes, *Lath.* Ind. Orn. ii. 627; *Gmel.* 738.—Le Coq de Bantam, *Buffon*, Ois. ii. 119; *Sonnini*, v. 185; *Temm.* Pig. et Gallin; *Bonat.* Tab. Encycl. Orn. 182; *Gmel.* Trad. Franç. ii. 409; *Frisch*, Vög. Tab. 129.—Les Poules de Camboge et de l'Isthme de Darien, *Buffon* par *Sonnini*, v. 184, and 185. Bantam and Rough-footed Cock, *Lath.* Synops, iv. 706 and 707.—*Albin.* Birds, iii. tab. 33 and 34.—*Hayes*, Brit. Birds, tab. 23. Das Bantamhuhn, *Bechst.* Nat. Deut. iii. 1289, var. e. Some with the feet feathered to the toes, others with the toes feathered, others with the feathers elongated behind. *Temm.* ut supra, iii. 658.

Description.—This is a small variety with short legs, most frequently feathered to the toes, so as sometimes to obstruct the fowls in walking, but booted legs are not exclusively peculiar to bantams; so far from this, that bantam fanciers, with Sir John Sebright at their head, prefer those which have clean, bright legs, without any vestige of feathers.

The full bred cock should have a rose comb, a well feathered tail, full hackles, a proud lively carriage, and ought not to weigh more than one pound. The nankeen-colored and the black are the greatest favorites. If of the latter color, the bird should have no feathers of any other sort in his plumage. The nankeen bird should have his feathers edged with black, his wings barred with purple, his tail-feathers black, his hackles slightly studded with purple, and his breast black, with white edges to the feathers. The hens should be small, clean legged, and match in plumage with the cock.

About two hundred years ago, Aldrovand described the bantam cock to have the neck and back of a chestnut color, the wings at first black with whitish spots, afterwards black, the quill-feathers being white on the outer, and black on the inner sides; the throat, breast, belly, thighs, and legs, black with whitish spots; the feet yellow; the comb double and not very large; the beak yellow; the wattles large; the tail-feathers partly white and partly black.

The female bantam is described by Aldrovand to be of a yellowish color, and everywhere except the neck marked with oblong black spots; the wattles and comb are small; the beak and feet are yellow.

13. *Turkish Cock.*

Synonym.—Gallus Turcicus. *Brisson*, Orn. i. 170, var. d; *Idem*, 8vo, i. 46. *Aldrovand.* Av. ii. tab. p. 314–16. *Willugh.* 110. *Borowsk.* Nat. ii. 180. Phasianus Turcicus, *Lath.* Ind. Orn. ii. 627 *Gmel.* 738. Le Coq de Turquie, *Bonat.* Tab. Encyc. Orn. 182. Das Turkischehuhn, *Bechst.* Nat. Deut. iii. 1829, var. b. Turkish Cock, *Lath.* Syn. iv. 707.

Description.—This is generally considered to be a variety of the Bantam cock by M. Temminck and other writers, distinguished chiefly by the beauty and variety of its colors.

The Italian naturalist, Aldrovand, describes the Turkish cock as having the whole body whitish, except the wing-feathers and belly, which are black; the tail black, tinged with iridescent green,

and some of the feathers green on the one side, and black on the other; the body is streaked partly with golden and partly with silvery streaks, which add wonderfully to its beauty; the legs and feet are bluish.

The Turkish hen is described by Aldrovand to be white, spotted here and there with black; the feet somewhat blue; the wattles are smaller than those of the cock; she is in every other respect like the cock, except that her neck is yellowish, and her tail all of one color.

Aldrovand also describes another variety of the Turkish cock, with feet entirely blue; the body spotted with white and black; the neck ashy-yellow; and behind the comb there is a crest of white feathers.

14. *Dwarf Cock.*

CHAR. SPEC.—Gallus Bankiva (*D*) Pumilio, *Temm.* Male and female with very short legs; size of a pigeon. Gallus Pumilio, *Brisson*, Orn. i. 171, sp. 2; *Idem*, 8vo, i. 46; *Raii*, Synops. 51, a, var. 2; *Frisch*, Tab. 133 and 134; *Willughby*, 110, Tab. 26; Storia degli Uccelli, ii. pl. 214. Phasianus Gallus Pumilio, *Latham*, Ind, Orn. ii. 627, var. n; *Gmel.* Syst. Nat. i. 738, y. Le Coq nain, *Buffon*, Ois. ii. 118; *Sonnini*, v. 183; *Temm.* Aig. et Gallin. ii. 244. L; Acaho ou Coq de Madagascar, *Buffon* par *Sonnini*, v. 182; Hist. Gener. des Voy. viii. 603. Le Coq de Java, *Bonat.* Tab. Enc. Orn. 182. Dwarf Cock or Creeper, *Lath.* Syn. iv. 705. Das Zwerghuhn, *Bechstein*, Nat. Deut. ii. 1288; agrees with our own except in size; *Temm.* ut sup. iii. 658.

Description.—This variety, which is not larger than a pigeon, differs from the Bantam chiefly in size, and in the shortness of its legs. The acaho of Madagascar is described as very small, with a circle of feathers about the legs, a thick tail, which it carries straight, and the ends of the wings black. Other varieties, said to come from Cambodia, and now found in the Philippine Isles, have the legs so short as to drag the wings on the ground. In addition to these, Buffon mentions a sort of fowls in Britanny, which are always obliged to leap, the legs being so short. These, however, are not small, but of the size of a dunghill fowl. The hens will hatch thirty eggs at a time, that is, more than double the number usually set under common hens. Some think that these dwarf fowls are the Hadrian breed mentioned by Pliny. Aldrovand describes the dwarf hen as all black, except the quill feathers of the wings, which are white at the ends, and on the neck are some white crescent-like spots, and a yellow spot around the eye. The head is furnished with a crest of feathers; the comb is small and dark colored; the feet are yellowish, and the claws equal and very white. Aldrovand does not mention the cock of this variety.

15. *Rumkin.*

CHAR. SPEC.—Gallus ecaudatus, primus, *Temm.* Male with the comb entire; lower mandible with double wattles; no tail; rump with large covert feathers; body on both sides brownish-orange. Female not described. Coq Wallikikili, *Temm.* Pig. et Gallin. ii. 267. Inhabits Ceylon. Feet ash-grey; comb and wattles blood-red. Length 13 or 14 inches. This species is destitute of the rump and coverts. (*A.*) Gallus ecaudatus, Domesticus. Tail or rump awanting, variegated with beautiful colors. Gallus Persicus, *Brisson*, Orn. i. 174, No. 5; *Jonston*, Av. 58. Phasianus Gallus ecaudatus, *Latham*, Ind. Orn. ii. 627; *Linn.* Syst. Nat. i. 271, var. y; *Gmel.* Syst. Nat. i. 738; *Raii*, Synops. 51, a. 1 var. 3; *Frisch*, Tab. 131 and 132; *Borowsk*, Natt. ii. 181. Le Coq sans croupion, *Buffon*, Ois. ii. 122; *Sonnini*, v. 193, No. 16; *Gmel.* Trad. Franç. ii. 408, f; *Temm.* Pig. et Gallin. ii. 271. Persian Fowl or Rumkin, *Willughby*, Orn. 156, No. 6, Tab. 26. Rumpless or Persian Cock, *Lath.* Syn. iv. 705. Das Kluthuhn, *Frisch*, Tab. 131 and 132; *Bechst.* Nat. Deutschl. iii. 1287. (*a*) Das gehaubte Kluthuhn, *Frisch.* t. 130.

Temminck and other naturalists now consider this to be a distinct species rather than a variety, taking its origin from a wild species still to be found in Ceylon. It is distinguished by the want of a tail, by the comb not being in the wild birds indented, and with the wattles blood-colored rather than scarlet. The feathers are all of a dusky orange in the wild birds, but finely variegated in the tame ones. As these fowls were commonly domesticated in Virginia, Buffon erroneously supposed them to be indigenous to America. Although the wild species has not indentations in the comb, this is not the case with the tame ones, which have often a large indented comb. Aldrovand describes the cock as black interspersed with white, the rest white; the feet cinereous. The hen, he says, has a smaller comb than the cock, and is of a rusty color, except three black feathers in each wing.

From the rumkin being destitute of the gland on the rump, M. Reaumur derived one of his arguments against the almost universal opinion, that this gland is designed to furnish birds with a sort of oil with which to dress their feathers—an opinion not very tenable when closely examined. The rumkin has not the least vestige of this rump gland; but the place where it ought to be, as in other fowls, is more depressed than the rest, the flesh being smooth, and without any secretion or excretory ducts.

"All," says Reaumur, "have been of opinion that the feathers of birds, in order to be sheltered against rain, wanted to be done over with a kind of oil or grease, that might cause the water to run off them without penetrating them, and that this unction wanted to be repeated from time to time. In consequence of this, they have pretended to make us admire a reservoir of unctuous matter placed on the rump of each bird, out of which it expresses, and takes it with its bill to convey and spread it all over the feathers that require it. In order to expose a notion that must needs have been pleasing, since it is universally espoused, it need only be mentioned, that the feathers of the tailless or rumpless hens are as much proof against rain as those of other hens, and of many other birds that are provided with a rump in which the secretion of an unctuous liquor is effected."—(*L'Art faire eclore*, ii. 10.)

16. *Silky cock.*

CHAR. SPEC.—Gallus lanatus, *Temminck.* Male and female white, with feathers like hair. Gallus japonicus, *Brisson*, Orn. i. 175, No. 6. Tab. 17. fig. 2, fem.; *Idem*, 8vo, i. 48. Phasianus Gallus lanatus, *Latham*, Ind. Orn. ii. 628; *Linn.* Syst. Nat. i. 271; *Gmel.* Syst. Nat. i. 739; *Borowsk.* Nat. ii. 180, g. Le Coq et La Poule à duvet, *Buffon*, Ois. ii. 121; *Idem*,

Pl. Enl. 28, fem. domest; *Sonnini*, v. 190; *Bonat.* Tab. Ency. Orn. 183, var. g; *Gmel.* Trad. Franç. ii. 410; *Temm.* Pig. et Gallin. ii. 256. Silk Cock, *Latham*, Syn. iv. 702. Das Wollhuhn, *Bechstein*, Nat. Deut. iii. 1291. Inhabits China or India. This species differs in having the webs of the feathers disunited, and like hair; feet scaly, naked, or feathered; comb and wattles ruddy blue; skin and periosteum black; iris bright yellow; beak and feet blue. *Temm.* ut supra, iii. 661.

Description.—Modern naturalists make this also a distinct species. It has the whole body covered with feathers, the webs of which are so disunited as to appear like hairs, or glossy silk; the general color is white, and the legs covered wholly on the outside quite to the toes. As in other varieties, individuals of this sort differ in respect to color; some are pure white, others dingy-brown, but all of them with dark colored legs, on which, for the most part, are thick, stout, short spurs; though some are totally without spurs: nor are the legs always feathered. Both this species and the negro cock described onwards, have the outer skin and the bones black, and have grown into disrepute on account of the facility with which they contaminate our common poultry, so as to render them unseemly both in bones and wattles. They are indigenous in Japan, where they are valued, and also in China, where, however, they are rather scarce. The people in Canton carry them about in cages for sale to the European traders.

17. *Frizzled Cock.*

Char. Spec.—Gallus crispus, *Temminck.* Male and Female, feathers turned backward, curled up, variegated with fine colors. Gallus crispus, *Brisson*, Orn. i. 173, pl. 17, fig. 1; *Idem*, 8vo, i. 47; *Linn.* Syst. Nat. i. 271. n; *Raii*, Synops. 51, a 1, var. 4; *Gmel.* Syst. Nat. i. 738; *Frisch*, Tab. 135; *Borowsk*, Nat. ii. 180, Storia degli Uccelli, ii. pl. 215. Gallina Frieslandica, *Willughby*, Orn. 110. Le Coq à Plumes frisées, *Buffon*, Ois. ii. 121, Tab. 13; *Sonnini*, v. 189, No. 13; *Gmel.* Trad. Franç. ii. 408; *Bonat*, Tab. Ency. Orn. 182, d; *Temm.* Pig. et Gallin, ii. 259. Crisped or Frizzled Cock, *Lath*, Syn. iv. 704; *Bancroft*, Guian. 175, Descript. of Surinam, ii. 159. Das Strupphuhn, *Frisch.* Vog. Tab. 135; *Bechst.* Nat. Deut. iii. 1290. Inhabits Asia, Java, Japan; feathers curled up, quill-feathers without rays; some with the feet feathered, others naked.

Description.—The present species is commonly named the Friesland cock, from confounding the term "frizzled" with "Friesland." It is a native of Java, Japan, and other parts of eastern Asia. It is distinguished by having all the feathers turned and frizzled, being smaller than our common fowls, more wild, and less suitable for domestic purposes. The chickens are very sensible to cold, and especially to wet, and are seldom reared but for curiosity. Those which partake most of the original breed have white plumage and smooth feet. The flesh is firm and delicate.

18. *Negro Cock.*

Char. Spec.—Gallus Morio, *Temminck.* Male and female, comb and wattles black, variegated with gay colors. Gallus Morio et Mozambicus, *Brisson*, Orn. i. 174; *Idem*, 8vo, i. 48; *Willughby*, Orn. 298. Phasianus Gallus Morio, *Lath.* Ind. Orn. ii. 628, var. U.; *Linn.* Syst. Nat. i. 271; *Gmel.* Syst. Nat. i. 739, var. U. and V. Gallus Persicus, epidermide nigricante, S. G. *Gmel.* Voy. iii. 285. Le Coq Nègre ou de Mozambique, *Buffon*, Ois. ii. 122, Voy. de Siam, i. 279; *Marsd.* Sumatra, i. 188, Trad. Franç.; *Sonnini*, v. 191; *Gmel.* Trad. Franç. ii. 409 and 411, var. m. and n.; *Temm.* Pig. et Gallin. ii. 253. Blackamore Pullet, *Freyer*, Trav. 53; *Harris*, Coll. Voy. ii. 468. Negro Cock, *Lath.* Syn. iv. 704. Inhabits Africa. This bird differs from others, in the comb, wattles, skin, and periosteum being black, so that when boiled for table, it seems as if it had been boiled in ink. *Temm. ut supra*, iii. 660.

Description.—This is a native of Africa, distinguished by the comb, wattles, skin, and bones, being black, as are also the feathers, though the flesh is white and good. Those which have been brought to Europe are only kept from curiosity.

19. *Barbary Cock.*

This African variety is generally of a pale or dun color, spotted about the neck sparingly with black; the feathers there being very full; on the crown is a large tuft of feathers, of the same color with the body.

20. *Dutch Cock.*

This is usually termed the Pencilled Dutch, and is only a variety of the common dunghill breed, having white feathers spotted with black. These are regularly imported from Holland.

21. *Russian Cock.*

This breed seems to differ chiefly from others according to Latham, in having considerable tufts of brown feathers springing from each jaw, and others longer or fuller from the lower mandible, like a Jew's beard.

In the female, there is an upright tuft spreading out from the hind head, of the same silky texture. Independent of these, the cock has the usual comb and wattles, and the hen a small comb likewise. This sort is said to have come from Moscow, and varies in color, one variety being white, with the ends of the feathers glossy blue or black, giving it a spotted appearance; and the legs being covered with fibrous or downy feathers. Another has the plumage of the game-cock, or fine tawny orange, spotted with black.

A sort from Russia is mentioned in the Transactions of the Highland Society, vol. x. p. 144, as much esteemed in Scotland for prolific laying; but as no description of these is given, I cannot ascertain their identity with Latham's.

Ever-laying Fowl.—Any of the above breeds may become what is termed ever-laying, that is, not inclined to hatch, an artificial temperament produced by domestication.

Comparison of Sorts.—The things most necessary to attend to in selecting sorts for breeding, are the number, size, and flavor of the eggs, and the color and delicacy of the flesh.

Number of Eggs.—The Scotch Russian cross with the common breed, seems to stand highest, and next to those, the Dorking, Poland, and Spanish.

Size of Eggs.—The largest eggs are laid by the Poland, and Spanish, the next by the Dorking.

The game sorts, and all the small varieties, lay small eggs.

Flavor of Eggs.—The finest flavored eggs are those with bright orange yolks, such as are laid by the game breed, and by speckled varieties of the common breed. The large eggs of the Poland and Spanish have often pale yolks, and little flavor.

Color of the Flesh.—Those with dark colored or yellow legs, have the flesh of a less pleasing white than those with pale flesh-colored or white legs.

Delicacy of the Flesh.—The game breed, the Spanish, and the Dorking, are the most delicate; the Malay coarse and inferior.

From the Farmers' Series of the Library of Useful Knowledge.

ON THE CONVERSION OF ARABLE LAND TO PERMANENT PASTURE, OR MEADOW.

All kinds of grass derive their chief value from the quality of the soil on which they are produced; for, whether natural or artificial, they afford more nutriment when taken from rich land, than the same quantity of a similar sort will when procured from ground of a poor nature; and they are materially influenced by its state of wetness or of dryness. Every species springs originally from some peculiar earth, which is best adapted to its propagation; for although most of them will grow on various kinds of land, yet they all have their favorite ground, and if transferred from the soil on which they spontaneously vegetate, to one of a different nature, prepared for them by tillage, they lose much of their hardiness and durability.

It might be supposed, that, as almost every sort of grass can be made to thrive during a short period on different soils, a remedy for this could be found by sowing only the best class of seeds—and to a certain extent that effect may be obtained; but experience has proved that it is easier to accommodate the plant to the soil, than to adapt the soil to the plant, and all land has such a tendency to reproduce those plants which are indigenous to the soil, that, after a series of years, more or less, according to the care which has been bestowed upon its cultivation, they will supersede those which have been artificially sown. This forms, indeed, one of the strongest reasons why sound old meadow should never be broken up without mature consideration; for to reproduce it, is one of the most uncertain operations of husbandry. It is, therefore, evident, that the closer we adhere to those seeds which are natural to the land, the more healthy will the plants be found, and the longer will the herbage retain those properties which are essential to its perfection; though it certainly may be much improved by a judicious selection of the better kinds, and by sowing only certain quantities of each, according as they are found to flourish with the most luxuriance, instead of sowing them indiscriminately.

Every one who intends to lay down land to a permanent state of meadow or pasture, should therefore make himself well acquainted with the best natural grasses, and the peculiar soils to which they are indigenous, as well as with the state of the land in regard to shelter, drought, or humidity, as affecting their growth and durability; and, having become master of these particulars, he should then select the seeds accordingly, either by purchase from some seedsman whose character may be presumed to guard the buyer from fraud, or, if desirous of obtaining them of his own growth, he may avail himself of the directions to be found at foot.*

So far, however, are farmers from generally paying any attention to this subject, that when they are in want of grass-seeds, they take them without any discrimination from the bottom of their own or their neighbor's mow, without considering of what species of grass they are, from what land they have been procured, or whether they are adapted to the land on which they are intended to be sown; "if they are hay-seeds, they are satisfied."† This, however, is very-short-sighted economy; for after land has been got into good condition, for the purpose of being converted

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* "If a piece of ground can be had, that is neither very moist nor very dry, it will answer for several sorts of seeds, which may be then sown on one spot; but if such a piece cannot be obtained, they must be sown on separate spots, according to their respective qualities, no matter whether in a garden, a nursery, or a field, provided it be well secured and clean. Dig up the ground, level and rake it; then sow each kind of seed thinly in a separate row, each row about a foot apart, and cover them over lightly with earth: the latter end of August, or the beginning of September, will be the most proper time for this business. If the weather be not uncommonly dry, the seeds will vegetate quickly, and the only attention they will require, will be, to be carefully weeded. In about a fortnight from their coming up, such of the plants as grow thickly together may be thinned, and those which are taken up, transplanted, so as to make more rows of the same grass.

"If the winter should be very severe, though natives, they may, as seedlings, receive injury; therefore, it will not be amiss to protect them with mats, fern, or by some other contrivance.

"Advantage should be taken of the first dry weather in spring, to roll or tread them down, in order to fasten their roots in the earth, which the frost generally loosens, and care must still be taken to keep them perfectly clear from weeds. As the spring advances, many of them will throw up their flowering stems, and some of them will continue to do so all the summer. As the seed in each spike or panicle ripens, it must be very carefully gathered, and sown in the autumn, at which time the roots of the original plants, which will now bear separating, should be divided and transplanted, so as to form more rows; the roots of the smooth-stalked meadow grass, in particular, creeping like couch grass, may readily be increased in this way; and thus, by degrees, a large plantation of these grasses may be formed, and much seed collected at its separate periods of becoming ripe."—Curtis on British Grasses, p. 31. Complete Grazier, 6th edition, p. 430.

Or, a piece of fine old meadow land, that is known to abound in the best sort of grasses, may be saved for seed, by letting it stand a few weeks longer than usual, and thrashing the hay out immediately, without suffering it to heat in the stack.—Middlesex Rep. 2nd edition, p. 305.—Com. to the Board of Agricul., vol. iii. p. 131.

An improvement on this latter mode would, however, be to divide the turf into three separate divisions, and to cut the grass from each at those different seasons when the plants respectively ripen their seeds, which usually is towards the latter end of June, the end of July, and in the first or second week of September; but great attention should be paid to the complete ripeness of the seeds, for if gathered before they are at perfect maturity, they will not produce plants.

† Holland's Survey of Cheshire, p. 186.

into meadow, the further charge of the best seeds should never be spared.

It is also the common practice of farmers, to sow those seeds with a corn crop, usually of barley; but, although they thereby save a year's rent and tillage, it is yet a losing plan in the end; for although the crop of corn thus obtained is valuable, yet when a good meadow is wanted, and when all the strength of the land is required to nurture the young grass thus robbed and injured, considerable expense is often incurred the second year for manure, which, with the charges of the crop, and the disadvantages attending it, will generally more than counterbalance its profit. A permanent sward of grass, with a bottom of richness and purity from weeds, can only be obtained by a thorough summer fallow,—so thoroughly effected as to cleanse the soil from every kind of weed, and to reduce it to a complete state of pulverization before the seeds are sown. By this means, they may be deposited in the ground early in the autumn—about the middle or the latter end of August; and if the land has been got into good heart by sufficient manure, and the seeds be judiciously chosen, they will then, not only stand the winter, but will probably sprout with such strength in the spring, as to prevent the propagation of weeds. A top-dressing of some friable manure or compost, which must be exceedingly well spread and minutely divided, should, however, be laid on in the course of the month of March, as early as the land will bear pressure, and the ground should be carefully hand-weeded, lest any noxious plants should arise. The expense, indeed, is considerable; but, as may be seen in the more serious affairs of life, so in no farming operation will half-measures be found to succeed; and when a man has such an object in view, as that of laying down land to produce crops without further cultivation during a series of years, he should calculate the loss which he will surely sustain, if he does not effect it in the most complete manner. The land should, in fact, be put in such order, as to produce nothing but what is intended to grow, and to bring that to the utmost perfection; but to carry it to that condition, no expense should be spared. If, however, the soil can be brought into good order by the means of a turnip fallow, then, indeed, the sowing of the grass-seeds may be deferred until spring; although, even in that case, we should recommend their being sown without corn: in proof of which, we may cite the following trials on three different sorts of soils, as stated by the late Mr. George Sinclair.*

Experiments.

1. A large field of *heavy clay*, in Buckinghamshire, which had been much exhausted by long continuance under the plough, was well cleaned, worked into as fine tilth as the unfavorable nature of the soil would permit, and manured with farm-yard dung and coal-ashes. The seeds were sown in August, at the collective rate of about four bushels to the acre, in different proportions in the order in which they stand; the largest being first, viz.—

Meadow fox-tail,	Rough-stalked meadow,
Meadow fescue,	Crested dog's-tail,
Meadow cat's tail,	White clover, and
	Cow-grass.

The vegetation succeeded as satisfactorily as the season of winter would permit, but a top-dressing was given in the following spring, and a few more seeds were sown at the same time. The pasture soon became fit to receive dairy stock, and proved so productive, that, after four years' experience of its qualities, another field of a similar soil, on the same farm, was also laid down.

2. This, however, although worked in the same manner as the former, had the addition to the seeds of

Cock's-foot, and
Perennial rye-grass,

which proved a great improvement; and the field was intended to be sown in spring. In consequence, however, of the difficulty of getting a flat tenacious clay into fine condition, the ground was not sown until the beginning of summer; but, although the seeds vegetated freely, yet such a quantity of charlock came up at the same time, that the plants were in danger of being choked, and it became necessary to give so thorough a hand-weeding, that it cost 12*s*. per acre. The grasses, however, sprouted vigorously, and in the course of two seasons, became equal to any old pasture on a similar soil.

3. A ten-acre field of *strong loam incumbent on clay*, in a high and exposed situation in the county of Cumberland, got a fallow of ten furrows, and having been harrowed and picked, till not a weed was to be seen, was sown in drills, with thirteen pecks per acre, of the following seeds:—

Cock's-foot,	Crested dog's-tail,
Perennial rye-grass,	Sweet-scented vernal,
Hard fescue,	Common meadow-grass,
Meadow fox-tail,	White clover,
Tall oat-grass,	Perennial red clover,
Larger meadow cat's-tail,	Trefoil, and
	Broad clover.

The next year, it carried upwards of forty wether sheep, with thirty-three lambs, and twenty yearling bullocks; thus keeping as much stock during the autumn, as a common turnip crop, and making the sheep equally fat.

4. *A light gravelly soil*, containing twenty-four acres, in Roxburghshire, was sown without a corn crop, on the 13th of April, 1832, with 2¾ bushels per acre, of

Cock's-foot,	Sweet-scented vernal,
Meadow fox-tail,	Larger meadow cat's-tail,
Pacey's rye-grass,	Crested dog's-tail,
Tall oat-grass,	Common meadow-grass,
Mixed fescues,	Broad-leaved bent, or fiorin, and white, perennial red, and yellow clover.

On the 28th of June, eight scores of Leicester ewes, with their lambs, were put upon this pasture, and remained there until the 4th August, when they were removed, but were replaced on the 13th by ten scores of ewes, without their lambs, which continued until the 4th of October, at which period the account ends.

On this, Mr. Sinclair very justly remarks, "that

* See the Quart. Journ. of Agric., N. S., Nos. xviii. and xix.; and also four other experiments of a nearly similar nature, published in the transactions of the Highland Society, N. S., vol. ii. p. 198.

such extraordinary results could hardly have been expected, from what are called the artificial grasses, even if they were sown without a corn crop;" and he has stated that other experiments on various soils, and on extensive scales, have proved to him, "that, with clean preparation and judicious manuring, any land may be brought in a couple of years into a state of permanent meadow or pasture, nearly approaching to that of an ancient date, by sowing the seeds of the appropriate grasses." But, although entertaining the highest opinion of his judgment, yet in this instance we are inclined to doubt its accuracy, as all the information which we have been able to collect from other quarters shows that, after the first year or two, the luxuriance of the herbage declines, and is only after a long time so gradually renovated, as to acquire the richness and elasticity which is peculiar to an old sward. There, indeed, can be no doubt, that, by a skilful selection of the grasses most appropriate to the soil, a crop of herbage may be obtained of a quality so rich as to exceed that of the natural pasture during a short period; but that external coat composed of the tufts of grass or green turf, which we distinctively call *sward*, is formed by the roots, both alive and dead, and by the mould created by the decomposition of the latter, and therefore, can only be produced in a long course of years.

Management.

The grasses, when sown, should be combined with perennial red and white clover, in various proportions, adapted to the distinct properties of the land; for although grasses differ from each other in their habits of growth—some putting forth foliage, ripening their seeds at different seasons, and yielding different qualities and weight of product—yet, should it be attempted to produce a rich sward by sowing the seeds of only one species of grass, it will be found, that however closely the seeds may be sown, and the seedling plants may cover the surface, yet a considerable number of them will certainly decay, leaving blank spaces to be filled up, either by the accidental mixture of seeds blown from natural pastures in the vicinity, or by those of weeds. It is, indeed, a law of the natural economy of permanent grasses, to grow densely and promiscuously together; for they are found, side by side, in the richest natural pastures in such variety, that twenty different species, containing more than a thousand distinct roots, have been collected from one square foot of surface. It is, however, essentially necessary that the seeds be genuine and pure, as well as of the last year's growth, and that they be so intimately intermixed, that, if possible, two plants of the same kind, should not grow up together. But if the proportion which will be hereafter mentioned be sown in sufficient quantities to stock every part of the land—and with an appropriate selection of plants, there can be little doubt, that, if the soil be otherwise properly managed, the seedling grasses will be sustained, and may be brought to assume the character of rich pasture or meadow.

The management of the soil can, however, be only judiciously effected when the land is intended to be laid down, by rendering it in every respect as perfect as it can be made by previous tillage and manure, either through draining, paring and burning, or completely summer fallowing; and by the application of farm-yard dung, lime, chalk, marl, ashes, clay or sand, as circumstances may require; then, by carefully extirpating all root-weeds during the next and following season, by which time the surface will become closely covered with a thick and permanent sward. It should not only be perfectly clean and well pulverized, but the ridges should be levelled, and the furrows filled in, so as to render the surface quite uniform, and the seeds should be sown on a fresh tilth, finely harrowed. As regularity in delivery of the seeds is a point of the utmost importance, an expert seedsman should be employed, and they should never be sown either in windy weather, or when the ground is so wet as to occasion the least degree of poaching. They are, indeed, sometimes sown by machines, in drills, in which they can certainly be evenly distributed, but the spaces between the lines must still be left void, and an experienced and careful workman can sow them perhaps more effectually broadcast. The light sorts should, however, be divided from those which are heavy, and they should be sown separately; for, although this will occasion more casts than one, yet the trouble of going several times over the ground, is not to be put in competition with the equal distr bution of the seed.* They should then be lightly, but well covered in with harrows—not heavy, but formed with closely-set and very short teeth or tines; and if the soil is either spongy, or porous, it should be afterwards lightly rolled; though a large fold of five or six yards to each sheep, is a better mode of performing the latter. If the land be very light, or at all clotty, it is likewise advantageous to pass a light roller over it immediately previous to sowing the seeds. On strong land, however, rolling is not necessary; and as it is material, even on the very driest soil, to avoid the use of horses as much as possible on the ground after it is sown, it is very desirable to cover the seed with large hand-rakes, instead of harrows, so as wholly to prevent the foot-marks of the cattle.

The *best time of sowing* is, as we have already stated, *in the early part of autumn*—some persons even recommend the latter end of July;† but there can be no doubt, that, if the land can be got perfectly clean, it may also be advantageously performed in the spring. If the first plan be adopted, and the succeeding winter should prove severe, it is, however, not improbable that some of the seedling plants will fail, and therefore a small additional quantity of seed should be sown some time in February, or not later than the first fortnight of March, and then well rolled down, as the roots of the early-sown grasses may have been loosened by the winter's frost. If the land has been previously limed, pared and burnt, or marled, this will also be found the best time for laying on the farm-yard manure, which is necessary to afford nourishment and strength to the roots; and even

* The weights of the seeds differ so materially, that while those of most of the clover species exceed 60 lbs., per imperial bushel; that of rib-grass, 50 lbs.; of meadow cat's-tail, 40 lbs.; and the different varieties of rye-grass vary from 18 to 30 lbs.; yet most of the poa and fescue tribes are under 15 lbs., and many of the other grasses below 10 lbs.

† Bailey's Survey of Durham, p. 181.

if that should have been already applied previous to the sowing, yet a top-dressing of rotten dung, or a well-prepared compost of vegetable and animal matter, will occasion the plants to flourish: for it will be seen, that, like animals, the better they are supported in their youth, the stronger will they be when they grow up.

If, however, *spring sowing* should be chosen, then—if the land has not been previously prepared by a turnip fallow—the putrescent manure should be laid on before the seeds are put into the ground; if corn be sown at the same time, it should not be too thickly set, and the growing crop should be thoroughly hand-weeded. When the two crops are to be united, and the nature of the soil permits, barley is to be preferred to oats, for it has a greater tendency to loosen the texture of the ground, which is thus rendered favorable to the vegetation of the grass-seeds, and being reaped earlier, they will have the further advantage of being sooner exposed to the sun; for although a light crop of Lent corn is by many considered advantageous to their growth, by affording them shade and protection against the ardent heat of summer, yet, when they have acquired sufficient strength to be out of the reach of danger, it does them injury, as it protects every noxious weed equally as well as the young grass.*

The *management of the first crop* is a subject of much difference of opinion, some persons recommending it to be mown, while the greater number feed it off with sheep. The reason assigned for the former practice is, that by mowing it very early, and frequently rolling it, the grass acquires a closer bottom, and that sheep, in cropping the tender shoots of the seedling plants, pull some of them out of the ground. There may be some truth in this if the land be light, and sown, as such land frequently is, in the spring, though we have already seen, in experiment, No. 4, that even under those circumstances but little danger of material injury need be apprehended; but on strong soils, with autumnal sowing, the roots will have obtained too firm a hold of the ground to be destroyed by being fed in the following summer, and the land will thereby have the advantage of the dung.

Regarding the *soils most appropriate to the production of the permanent grasses*, it may be observed, that no land can be expected to form a good meadow, unless it be of a nature sufficiently retentive of moisture to afford nourishment to the roots, and to prevent them from being burnt up by the summer heats; though, if too wet, the herbage will become coarse, and infested with rushes and other aquatic plants. Loams are the best adapted, but they are too valuable to the arable farmer to be converted to grass; and, therefore, clays of so wet a nature as to be unsuitable to the plough, or else, land which, without regard to quality, is either subject to be overflown, or capable of irrigation, are the soils most commonly laid down. It must, however, be borne in mind, that, notwithstanding every care in the choice of the seeds, and the preparation of the soil for their reception, there are so many casualties which influence the growth of plants, that the difference of even half an inch in the quantity of rain which may fall in the course of the season will have a very decided effect in lessening the weight and value of their produce, although they may be of the like species, and in every respect, except as to soil and local climate, under exactly similar circumstances. Thus it has been justly observed by a late eminent botanist, that clear or hot sunshine may be highly beneficial on certain soils at a particular period of the progress of the crop, and on another and different soil it may be equally injurious; and moist or damp weather, varies likewise in its beneficial effects—or the reverse—according to the local circumstances of soil and site.

The *perennial grasses which are found in natural pastures*, amount to considerably more than a hundred different kinds; and there is no variety of soil, but is provided by the bountiful hand of nature with grasses peculiarly adapted to grow and remain permanent in each. However similar many of these grasses may be, when in a state of turf, no two species are found to agree in either the time of their being in the greatest perfection, the quantity or qualities of their nutritive matter, or any of the properties which constitute their value. Some are best for sheep, and flourish on elevated districts; others are calculated, on medium soils, for the dairy; and those on rich marsh lands for the fattening of cattle. Their periods of ripening are also different; and many, possessing different powers of withstanding the effects of drought or long-continued rains, consequently affect various kinds of soil.

The grasses which compose the produce of the richest natural meadow and pasture land, amount, however, to only between twenty and thirty distinct species, the rest being comparatively of little value, and of these, there is not a month, from spring until the close of autumn, but what, each in its particular season, occasions a superior luxuriance of growth, and brings them to ripeness. It will, therefore, be found, that by sowing the seeds of many grasses of dissimilar growth, there may be secured throughout the summer a succession of fresh herbage, so dense and abundant as far to surpass that to be obtained by the cultivation of only two or three species.* When combined, they

* A practice prevails in some places, which consists in sowing half a peck of rape, or a bushel of spring tares, instead of corn, with the grass-seeds. The rape thus gets up sufficiently high to shade the young grass; and in the middle of July, ewes are turned in, with their lambs, to feed it off. This deserves attention; for the cole does not rob the land as corn does, while the feeding of it occasions a great increase of manure: the tares, however, are apt to smoother the young grass.

* On this subject, the observations which we have already made on hay-making, may suggest the advantage of having in the same meadow, those grasses which flower as nearly as possible at the same time; some farmers may, therefore, be convenienced by the following enumeration, calculated as nearly as possible upon an average of seasons and local climate:—

In *May and June*, meadow fox-tail, flote fox-tail, sweet-scented vernal-grass, narrow-leaved meadow-grass, clover.

In *June and July*, cock's-foot, crested dog's-tail, yarrow, bush-vetch, waved-hair and water-hair grass, tall oat and yellow oat-grass, perennial rye-grass, fine and creeping bent, all the species of the fescue, and the poas, or meadow-grasses.

In *July and August*, flote fox-tail, fiorin, water-poa, or reed meadow-grass (which is the latest of the poas,) and meadow barley.

The seeds of these grasses are generally ripe about

vary according to the nature of the land; thus—

Sandy soils are generally stocked with hard and smooth fescue-grass; sheep's fescue; crested dog's-tail; smooth-stalked and meadow soft-grass; oat-like soft-grass, and some creeping plants of little note.

Calcareous soils abound with white clover; rough cock's-foot; meadow, hard and sheep's fescue; perennial rye-grass; upright perennial brome; rib-grass; yarrow; burnet; yellow oat, and sweet-scented vernal-grass.

Argillaceous soils encourage meadow fox-tail; meadow cat's-tail, or timothy grass; cock's-foot; tall and meadow fescue; tall and yellow oat-grass; rib-grass; yarrow; bush-vetch; sweet-scented vernal and perennial rye-grass.

Peaty soils have been found to contain sweet-scented vernal-grass; rough cock's-foot; meadow soft-grass; meadow fox-tail; meadow cat's-tail; creeping bent, and crested dog's-tail.

Fenny soils produce creeping bent, or fiorin: flote fescue; flote fox-tail; water-hair grass; and water-poa, or reed meadow-grass; and generally the usual aquatic plants.

A mixed soil, composed of these earths—sand, chalk, and clay—is found to give vigor to the following permanent grasses, of the qualities of the chief of which, and some of their varieties, we annex a brief description, together with some notes made by Mr. Taunton, a gentleman well known as an agriculturist, who, in 1823, sowed a great number on separate plots of a field of five acres of hazel-colored loamy sand, upon a chalky sub-soil; as well as upon some calcareous heights in the county of Surrey; and which, since that period, have never been manured, nor in some years, either mown or fed, until 1832, when his remarks were made.* Of these, several are known by the collective names of "*Poas*" and "*Festucas*," from these being the terms respectively applied to them by botanists: terms which we also retain in compliance with a custom lately introduced by almost every one who writes upon agriculture, though we cannot help thinking, that, among farmers, it savors more of affectation, than of any real knowledge of botany. Many of them, however, being only unimportant varieties of the same species, will not be here noticed, as those who may wish to ascertain the distinctive properties of each, will find a minute and scientific description of every class of the natural as well as cultivated British grasses, in the "Hortus Gramineus Woburnensis" of the late Mr. Sinclair—a work which should be in the hands of every intelligent farmer.

Poa annua, or annual meadow-grass, is not, as its name implies, permanent; yet, being in flower at different periods during the whole of the summer, it produces seeds, even when mown or fed, which spring again, and thus it forms a part of the sward as constantly as if it were perennial. Cattle of every kind are fond of it, and it is thought to have a peculiarly good effect upon milch cows in improving the quality of the butter; though its produce is comparatively small.

Poa pratensis, or smooth-stalked poa, is one of the most useful grasses, for it vegetates in the driest soils, supports its verdure during the winter, and in the spring throws out numerous shoots for early pasture: the hay is also of fine quality, and it flowers in the month of May.

Poa trivialis, or rough-stalked poa, bears a considerable resemblance to the preceding, both in its appearance and in the value of its hay; but its other properties are in some respects widely different, for while that flourishes in dry land, this is chiefly found on low meadows or moist pastures, and is therefore well adapted to ground which is intended to be irrigated. It also flowers rather later than the former, and is a tender grass, liable to be injured both by severe cold, or by excessive drought. It, however, affords abundant herbage, and, in places suited to it, grows to such a prodigious length, that it is said to have been found in the famous Orcheston Meadow, near Salisbury Plain, full eight feet long.*

Poa compressa, or creeping poa, flowers during the greater part of the summer, and is considered one of the most valuable of the tribe; for its dark green leaves, grow so firmly together, as to form a short turf of the richest pasture, which is supposed to contribute much to the delicate flavor of the flesh of sheep and deer, to which animals it is peculiarly grateful.

Poa angustifolia, or narrow-leaved poa, is a rich grass which delights in calcareous sandy soils, as well as in loamy clay; but, being a running-rooted plant, it should be only sparingly introduced among other grasses.

Poa nemoralis, or wood-meadow grass, has the peculiar property of flowering under the shade of trees, which renders it valuable on land which either contains forest timber, or which is closely fenced by plantations; but Mr. Taunton says, that in several beds of considerable extent, on which he has sown it, the plants were completely overpowered by other grasses; this was also the case with several different varieties of the poa species, as well as with many other grasses, which he inclines to attribute to the seeds being sown in too large quantities.

Festuca pratensis, or meadow-fescue, is a hardy plant, which bears broad succulent leaves, and, though a coarse grass with very hard stems, is well adapted to almost every kind of land, but more particularly to loams, active peat soils, or healthy well-drained clays: grows naturally on all pasture land that is not too dry. It is of very quick growth, produces an abundance of sweet herbage, which is much relished by all sorts of cattle, makes good hay, and flowers about the middle of June. Its seeds are also very abundant, and easily collected.

Festuca elatior, or tall fescue, Mr. Taunton considers as both the largest and most vigorous plant of which he is possessed. In a small meadow, on a loamy clay, which has not been manured for these nine years, but in which it forms a principal,

a month later; and care should be taken not to gather them, until in a perfect state of maturity, or the plants will fail.

* See the Quarterly Journal of Agriculture, N. S., vol. iii. p. 406.

* Papers of the Bath Agricultural Society, vol. ix. p. 154. Both species propagate themselves, but very slowly, by the roots; and, therefore, if not occasionally allowed to perfect their seeds, they will be subject to decay, unless fresh seeds be sown: in which case they should be separated by being well rubbed in a sufficient quantity of dry sand or lime, as they are connected by filaments which cause them to cling together. Those of the former are blunt; the latter pointed.

he still cuts two tons of hay to the acre; and he finds that both these species also abound and increase on the better specimens of calcareous loamy sand.

Festuca ovina, or sheep's fescue, forms a thick and fine turf on dry sandy soils, and on elevated land, forms a pasture which has been much recommended for sheep; but according to the experience of an eminent agriculturist, this species of fescue, and its other numerous varieties, have been described, from repeated observation, as being constantly refused both by sheep and all other cattle, whenever they could get any other kind of food.* It is, however, found very commonly upon the downs, together with the *festuca duriuscula*, or hard fescue, the *festuca glabra*, or smooth fescue, the *festuca cambrica*, or Welch fescue, and the *festuca rubra*, or creeping fescue, which are therefore all well adapted to poor land; and their herbage being nearly evergreen, has been described by Mr. Sinclair, as invaluable for winter pasture.

Festuca loliacea, or darnel-like fescue, in some respects resembles rye-grass, and has been supposed by botanists to be a hybrid plant, produced by rye-grass and flote-fescue; but this is a mistake, as the darnel both springs earlier and is superior in produce to rye-grass.†

Lathyrus pratensis, or meadow vetchling, furnishes a copious, succulent and tender herbage of very considerable bulk, is relished by cattle, and forms an important addition to the crop of hay, though it flowers late. The *vicia sepium*, or bush-vetch, which is a variety of the former—both being species of perennial tares—flowers earlier, though not until July, and some extraordinary instances of its product have been recorded in different experiments regarding its culture.‡ Mr. Taunton found that they had spread both on his sandy loam and upon his clays; but although the latter had the advantage in point of increase of plants on the light land, yet the produce was not so large as upon a more clayey soil.

Plantago lanceolata, or rib-grass, though generally combined with other grasses, yet has been sown without admixture, and produces a considerable herbage on rich sands and loams, and on poorer and drier soils answers well for sheep; being much used on the hills in Wales, where its roots spread and occasion a degree of fertility in districts which would otherwise be little better than bare rock. But botanists differ in their estimation of its qualities, for by some it is said to be injurious to cows, and by others, it is asserted that the richness of the milk in the celebrated dairies of the Alps is attributable to this grass, and the common lady's mantle, or *alchemilla vulgaris*. When sown along with clover, it is also said to prevent cattle from being hoven.‖

Poterium sanguisorba, or burnet, is also frequently sown alone, and is considered as the best adapted of all forage plants to bear the rigor of winter in exposed situations; it is, therefore, much used by stock-masters, particularly for sheep, as it supplies an important addition of food in the pinching season of the early part of spring; but if made into hay, when uncombined with other grasses, it is coarse and unpalatable. By itself it is, indeed, an inferior food; for although it possesses a tonic and aromatic property, which renders it of considerable value when mixed with the grasses of the elevated pasture of the downs, and it is there invariably cropped close to the ground, yet if grown separately, it is rejected by all stock, unless they be pressed by hunger. When intended for summer pasture, or for hay, it should therefore be joined with other grasses; or, at least, with white clover, which will both render it more palatable, and afford a heavier crop, than if sown alone. On poor chalky soils, it has also been tried with good effect in combination with cock's-foot, and also with small quantities of meadow-fescue and perennial-fescue; and its hardy nature on soils of that description, renders it worthy of attention. It forms, indeed, a large portion of the natural herbage on some extensive tracts of the South Downs, and although most abounding on chalk, it thrives also in both sand and gravel.

Alopecurus pratensis, or meadow fox-tail, which is one of the earliest and most valuable grasses produced in our climate, vegetates with extraordinary luxuriance, and is therefore abundant, both as a first crop and as after-grass; it is therefore justly considered as holding the first place among the best grasses, whether used green as fodder, or made into hay, and cattle are very fond of it, though it is said to be less relished by oxen, than by other stock. It produces a great quantity of seed, which may be easily gathered while the grass is growing, as it overtops most others; but the seeds are seldom found in hay, for they generally ripen and fall out before the other grasses are ready to be mown. There are two other species of the fox-tail, which all flourish chiefly on strong moist soils, but, although each bearing nearly the same character, this is the best. Mr. Taunton says, that on his dry ground, he found them all considerably weakened, and that one of them—a German black-seeded species—had nearly disappeared; but where they were mixed in a meadow on clay, with a dark moory mould on the surface, they each maintained their size and bulk as well, or better, than any other grass. They indeed grow to great perfection on all moist loams and clays; and although not cut until late in the summer, when the radical leaves of many other grasses are decayed or withered, these continue green, and present no impediment to the scythe. "In fine, it possesses all the requisites of a good grass —namely, quantity, quality, and earliness." It yields also abundance of seeds, but they are subject to be destroyed by an insect.

Cynosurus crystatus, or crested dog's-tail, grows upon sandy and calcareous soils, and is, therefore, well calculated for dry upland pastures, where it forms a thick, short turf, and affords wholesome food for sheep. It flowers about July; but the variety called *Cynosurus cæruleus*, or blue dog's-tail, which is found upon the tops of the highest limestone rocks, is one of the earliest grasses, and as it endures the summer drought, is therefore well calculated for sheep pasture.

Phleum pratense, or meadow cat's-tail, of which there are two varieties,—the larger and the less,—

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* Essay by George Tollet, Esq. Comm. to the Board of Agric. vol. iii. p. 428.

† Sinclair, Hort. Gram. Woburn., p. 179.

‡ Withering on British plants, vol. iii.; and letters in the papers of the Bath Society, vol. iii.

‖ Cheshire Report, p. 181.

is also known as "Timothy-grass," under which name it has been extensively cultivated, uncombined with other grasses, in America, where it produces very large crops, and when first imported into this country was supposed to be a new species. It is chiefly produced on moist and rich loams and peaty soils; was found by Mr. Taunton to have nearly vanished from his chalk and rich loamy sand, and to have entirely disappeared from the poor calcareous heights. The first variety is said by Mr. Sinclair, to be the most valuable for pastures of the first and second quality of land; yet the second is superior, particularly for winter food, in the poorer soils. On the elevated declivities of clay soils, it pushes up shoots of great succulence, which, if neglected in the summer, are rendered palatable to stock by the frost.* When used for green food, for which purpose it is peculiarly calculated, it yields abundantly throughout the summer, and is well relished by cattle, if kept close fed down; but if made into hay, it should be cut before it comes into flower, as the stems will otherwise become as coarse as straw: it, however, flowers late, and may, therefore, be advantageously mixed with other meadow grasses, though its seeds are small and difficult to collect.

Dactylis glomerata, or rough cock's-foot, flowers in June, and is also sometimes cultivated alone, but in that case it should be likewise cut early if made into hay, or kept close fed down; for, if allowed to become rank, it grows very coarse, and will in that state be rejected by cattle, though in its young growth they readily eat it, and sheep have a decided liking for it. If allowed to get up, it also forms large tufts of a very unsightly appearance, which overpower the other grasses. It produces very abundant crops upon land of a medium quality, on most of which it is very common; but light sands, or chalky downs, and either a total want of clay, or very stiff and wet clays, are alike unfriendly to its growth. It springs early, which is an essential point in pastures; and, if made into hay, it quickly yields an abundance of after-grass. If sown alone, two bushels per acre is the usual quantity; and as it thrives with great luxuriance under the shade of trees, it is a valuable plant to be sown in orchards.

Avena elatior, or tall oat-grass, though a coarse plant, yet vegetates with great luxuriance; but, according to Sir Humphry Davy, though very productive, it is disliked by cattle, especially by horses, which, he says, perfectly agrees with the small portion of nutritive matter which it contains. He adds that it thrives best on strong tenacious clay; but Mr. Sinclair states that its variety, the *Holcus avenaceus*, or tall oat-like soft-grass, though found in clays and shady places, is natural to sandy loams.†

Avena flavescens, or yellow oat-grass, though another variety of the above, is stated by Sir Humphry Davy, to thrive so much better on calcareous soils, that its produce has been doubled by a top-dressing of lime; but that, although not liked by cattle, it is said to make good sheep pastures. As they both, however, seldom flower before the beginning of July, they are generally mown before that time; and, therefore, being then comparatively tender, this dislike, if it really exists, is not observeable in the hay. Mr. Tollet says, that cattle are very fond of it; and the Rev. Arthur Young states it to be a profitable grass "when kept close fed."* This difference of opinion we must leave to the experience of others to reconcile, only remarking, that we have never heard any objection made to it by farmers; as well as that of Mr. Taunton, regarding the soil to which it is most appropriate, for he says, "that in parts where the soil was too light to encourage its luxuriant growth, it dwindled and became insignificant, but that it appears to cherish a considerable affection for argil." He adds, however, "that it is so rich in its qualities, and so universal a citizen of the world, that there is no soil, from the lightest calcareous loam, to the stiffest clay, into which he would not introduce it, where he intended to produce a permanent turf."

Achillea millefolium, or yarrow, is one of the most common as well as one of the most valuable of our grasses, as it has been found to form part of all our richest pastures, and is so grateful to every species of stock, that it is close fed down as fast as it springs, thus frequently escaping observation unless the turf be attentively examined. A considerable prejudice was, however, formerly entertained against this plant, which was by many persons considered worthless, or even injurious to cattle, until the contrary was proved by Dr. Anderson,† and confirmed by Sinclair, who, however, considers it beneficial to stock, rather as a condiment, than as affording direct nutritive matter. It suits almost every species of soil, and possesses besides the faculty of resisting drought on arid land. It flowers about the end of June, or the beginning of July.

Holcus lanatus, or woolly soft-grass, called also "Yorkshire white," flourishes about the latter end of June, in moist, sandy situations, and together with another variety, the *Holcus mollis*, or common soft-grass, is chiefly used on sheep walks, and answers well for that purpose, but is not relished by other cattle, and is said to occasion a violent discharge of urine and general weakness, if given to horses.

Anthoxanthum odoratum, or sweet-scented vernal, is one of the earliest of our grasses, and grows on almost every kind of soil. Although neither very productive nor nutritive, and far from being a favorite with cattle when given to them alone, it yet possesses a peculiar value of being the only fragrant plant natural to our fields, and imparts the delightful perfume which is so perceptible in new hay. It, indeed, forms a part of the herbage on all good meadow land, and although its chief utility seems to consist in giving flavor to the dried fodder, yet, when thus mixed, it is grateful to all stock, and, therefore, should always be sown with the other seeds of permanent grass.

Lolium perenne, or perennial rye-grass, contains upwards of sixty varieties, some of which are annual. It has been so anciently cultivated in England, that it is mentioned in "Worlidge's Hus-

* Sinclair on the grasses best adapted for winter pasture: Prize Essays of the Highland Society, No. xx. p. 32.

† Davy's Lectures on Agric. Chem., p. 368. Sinclair on the grasses best suited for winter pastures: Prize Essays of the Highland Society, No. xx. p. 32.

* Davy's Lectures, p. 369. Tollet, Comm. to the Board of Agric. vol. iii. p. 433. Young, *ib.* 146.

† Essays, vol. ii. p. 252.

bandry," in 1677, since which time there have been numerous improvements on the common sort, of which those best known are Pacey's, Russell's, Whitworth's, and Ruck's, which are all considered perennial. Mr. Taunton, however, observes, "that not only in his experimental ground, but in his field culture, on chalks, and on the deepest and richest loamy sand, he has experienced the utter eradication of every variety of the most approved species; though he does not feel himself warranted to infer that there is no species of rye-grass which is perennial on certain soils, as his experience induces him, on the contrary, to believe that in different parts of the kingdom it is indigenous." It is, notwithstanding, found to flourish on most kinds of soil, and grows under circumstances of different management on many upland situations, though sound and somewhat moist midlands are the most appropriate. It soon arrives at perfection, and produces in its first years of growth a good supply of early herbage which is much liked by cattle, and has been described by Marshall, as of such forcing quality, that, "no matter how short the first spring grass may be, so the cattle can get hold of it, they are sure to thrive amain.*" This, however, may be easily accounted for, as there is not at that season of the year another blade of grass to lower its value.

These apparent merits have doubtless upheld its use among farmers as a favored grass, and it is not uncommonly sown in arable land, along with clover, for a single crop; but the lattermath is very inconsiderable, and it impoverishes the soil in a very great degree, if the culms—which are invariably left untouched by cattle, when they grow strong and coarse—are not cut before the seed arrives at perfection. Notwithstanding this, it is, however, sometimes left to stand for seed, in which case it is thrashed like other grain, but the straw only serves as litter. To this we have also to add, upon the authority of Mr. Sinclair, that if the nutritive powers of rye-grass be compared with cock's-foot, it will be found inferior in the proportion of nearly five to eighteen; also inferior to meadow fox-tail in the proportion of five to twelve, and to that of meadow fescue, as five to seventeen.† The chemical analysis on which he founds that assertion must, however, be received with some degree of caution; for it unquestionably does not accord with the experience of farmers.

There is, however, another species of this plant which has been lately introduced from the continent under the name of *Italian rye-grass*, and is distinguished from the common species by its larger leaves, by being of a darker green, and by growing to a greater height. On comparative trials with some of the most favorite kinds of the common rye-grass, it has been found to exhibit a great superiority of growth, and it has been represented as being softer, more juicy, and more greedily eaten by cattle, whether in a green or dry state. It is also said to be of such a hardy nature, that, when cut in November, it has put forth fresh shoots of a foot in length in the close of December, and has been found to stand the winter in the north of Europe. Its durability in the soil, as a perennial grass, remains yet, however, to be proved; and, although the experiments which have been already made, seem to confirm the high character which has been given of it in other respects, yet further experience seems necessary to determine its real value.*

Trifolium repens, or white clover, is also known under the name of "Dutch clover," from our having first learnt its use from the Flemings, and from large quantities of the seed being imported from Holland. Its favorite soil is limestone, but it is one of the most general grasses throughout this country, being found in almost every situation from the lowest to the highest meadow, though on very poor land, it is often so small, and grows in such a creeping manner among the lower leaves of other herbage, that it is scarcely perceptible until brought up by top dressings; which probably has given rise to the very general opinion, that it is indigenous to some soils. The central root penetrates to a considerable depth, and the plant is thereby enabled to resist the effects of drought, particularly on sandy soils: the branches which trail on the surface send fibrous roots from their joints down to the ground, and hence this species of clover maintains itself in land of opposite qualities; for if the surface be too dry to afford nourishment to the foliage, it is preserved by the roots. It is not, however, so nutritive as the common annual red clover, nor does it form a good pasture when sown by itself, for it has been found to occasion disease in sheep; but, combined with other grasses, it is a valuable plant.†

Trifolium pratense, or native red clover, known also by the name of "marl-grass," is a perennial plant, while that species, which also bears blossoms of the same color, and is so generally cultivated in arable land, is only biennial. There is likewise a variety termed "cow-grass," which is still more permanent than the former, and is therefore more generally sown among grasses. This bears a rich purple flower, which comes into bloom in the month of July, and was found by Mr. Taunton to furnish a darker colored and heavier swath than any other part of his experiment ground; it is, therefore, decidedly perennial; and, considering that no manure had been applied to this spot during the previous eight years, it proves that it will clothe even a light sandy soil with luxuriant herbage.

Ranunculus acris, or butter-cup, and *Rumex acetosa*, or sorrel, are only noticed to be avoided, for although they are both found in our pastures—the former particularly in some of the richest—yet they are never seen to be eaten by cattle of any description, unless pressed by necessity. The presence of sorrel also indicates a state of acidity in the soil which can only be corrected by the application of lime.

From this number, any intelligent farmer may select those seeds which are the most appropriate to his land; for it is very difficult to furnish any general rule on the subject. On laying down land

* Rur. Econ. of Gloucestersh., vol. i. p. 162.

† Hort. Gram. Woburn., p. 215.

* In the *Bulletin des Sciences Agricoles*, it is stated to be generally sown in the autumn, at the rate of 16 to 18 lbs. per acre, and the seed rolled in; that in the next autumn, the turf is covered like an old meadow, and the crop of the following year is more than double: its growth, also, is so rapid, that if sown with clover or lucerne, it will quickly choke them.

† Sinclair, Hort. Gram. Woburn., p. 223.

of a medium quality, without reference to any particular soil, the following will probably, in many cases, be found the most useful. The quantity to be used must, however, be varied according to circumstances, as the proportions of the different species to be sown must always depend on the nature of the soil; and if every kind should not be sown, the others should be increased accordingly.

Smooth-stalked poa,	8 quarts.
Rough-stalked poa,	8 "
Meadow fescue,	12 "
Meadow fox-tail,	8 "
Crested dog's-tail,	6 "
Rib-grass,	4 "
Timothy-grass,	4 "
Yellow oat-grass,	4 "
Perennial rye-grass,	12 "
Cock's-foot,	4 "
Yarrow,	4 "
Sweet-scented vernal,	2 "
White clover,	6 lbs.
Cow-grass and annual meadow-grass.	4 lbs.

The common practice is, with the exception of clovers, to sow those seeds by measure; but it has been suggested by Mr. Lawson, of Edinburgh, seedsman to the Highland Society, that it would be more correct to sow them all by weight; "for although in grass-seeds, the greater weight of one is no criterion of its superiority over another variety of less weight, yet a greater weight in the same variety, always denotes a superior quality. Thus when seed is light, and consequently inferior, the greatest number of seeds is obtained by adhering to a given weight; and hence there is the chance of nearly an equal number of plants springing up as when the seeds are plump and heavy." With this view he has given several tables regarding the application of the different seeds under various circumstances; one of which we here select, and refer our readers for the remainder, to his essay in the Quarterly Journal of Agriculture.*

For Permanent Pasture, per Imperial Acre.

	Light soil.		Medium soil.		Heavy soil.	
	With a crop.	Without a crop.	With a crop.	Without a crop.	With a crop.	Without a crop.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Perennial rye-grass,	12	24	12	24	12	24
Meadow fox-tail,	1¼	2½	2	4	3¼	6½
Timothy-grass,	—	—	1½	3	3¼	5½
Meadow fescue,	2½	4	2½	4	2½	4
Cock's-foot,	5	8	3¼	6½	2½	4
Rough-stalked poa,	—	—	1¾	3¼	3¼	6½
Smooth-stalked poa,	3¼	6½	1½	3¼	—	—
White clover,	5	8	5	8	5	8
Red clover,	1½	2½	1½	2½	1½	2½
Hop-clover, or trefoil,	1½	2½	1½	2½	1½	2½
Cow-grass,	1½	2½	1½	2½	1½	2½
	33½	60½	36	63½	36¼	66

We have reduced the above, as nearly as we could, without descending to fractions, from the weights given for the Scotch acre; and although we are of opinion that a more complete selection might have been made, yet it will serve to call attention to the principle on which the table has been framed.

There is a very large tract of land, called *Stonebrash*, which extends from the north of England through Warwickshire, Gloucestershire—the Cotswold hills being almost wholly composed of it—with some parts of Wiltshire and Somersetshire. Under the greater portion of this district there are beds of marl, which have been very much used in the conversion of arable to grass, and with such extraordiuary advantage, that the value of the ground is said to have been in some instances trebled, and even quadrupled, in value. The grasses usually sown are—

Perennial rye-grass,	1 bushel.
Marl, or cow-grass,	10 lbs.
White clover,	3 lbs.
Hop-clover, or trefoil,	1 lb.

The grasses are sometimes mown and sometimes fed in the first year, though the latter is considered the better practice, and the marling does not take place until the following July, as it is necessary that the land should be well covered with grass when the marl is laid on; for if the surface be naked, it will cake, and the summer's heat will burn up the young plants. No natural grasses are sown, but they come up spontaneously, and in about three years, they take place of those which are artificial. From that time—as we learn upon the authority of Mr. Davis of Longleat, the surveyor of Wiltshire—the land continues, for the space of nearly twenty years, and sometimes more, to be equal to the best native meadow-land in the country; but after that period, the marl sinks into the ground below the reach of vegetation, the grasses decay, and mosses take their place. When again ploughed up, it, however, bears several crops of corn previous to a repetition of the marling, which is done in the same way as at first, and with equal success.†

Nearly the same plan of seeding has been followed in Dorsetshire and some other places, which do not possess the advantage of marl, only varying the quantity of all the seeds except rye-grass, to equal amounts of six or seven pounds each. By

* New Series, No xxiii.

† Comm. to the Board of Agriculture, vol. iii. p. 90.

this means there is an almost constant supply of feed: for the hop-clover and rye-grass supply it early in the spring; the cow-grass is in perfection in July, when the former decline; and the white clover from August to the remainder of the season. The grasses, however, only last during five or six years.*

Aquatic Grasses.

When, however, the soil is chiefly composed of one principal ingredient, as, for instance, if chalk, peat, or very wet clay, greatly predominates, but few of the grasses will grow in combination. Thus several of the aquatic species which are found in wet low lands and boggy soils, will, however thickly sown, ultimately become solitary: of this nature are—

Alopecurus geniculatus, or flote fox-tail, which grows in situations so liable to inundation, that the other good grasses, if sown there, are soon expelled. In respect to the degree of moisture which it will support, it stands between the rough-stalked poa and the flote fescue, and thus forms a connecting link between our fens and moister meadow lands; for it is found in some of the richest marshes, and is then much esteemed for its fattening qualities, in pasture as well as for hay. It is a creeping plant, which flowers in May and June, and grows from the centre in a nearly horizontal position, the lower joints touching the ground, and it may be propagated by slips.†

Festuca fluitans, or flote fescue, which grows sometimes in water and sometimes out of it, yet cattle are so fond of it, that they often endanger themselves to get at it, and it is said that the Cheddar and Cottenham cheese owe to it much of their celebrity. It springs early, and, when made into hay, it is soft and pleasant, if cut in the sap, and bears a bluish green color. There is also a variety called *festuca loliacea*, which flowers in June and July, and is found in marshy situations, where it is considered a valuable grass, but it has a coarse, broad, reed-like foliage.

Aira aquatica, or water hair-grass, which is found in a wild state on the margins of pools of standing water, where it flowers in June and July, and is grown in some of those fens which have not been perfectly drained, is also said to contribute much to the fine quality of the Cambridge butter.

Poa aquatica, or water poa, also called reed meadow-grass, flowers in July and August, and is very highly esteemed throughout the fen-lands of Cambridgeshire and Lincolnshire. It is, indeed, so particularly abundant as well as so much valued in the Isle of Ely, that it there forms a great source of their dairy riches, being considered excellent food for cows, though not relished by horses, and grows to the great height of six feet; it is, however, usually cut when about four feet high, and is bound up into sheaves. When stacked, and lightly fermented, it acquires a white surface, and is provincially termed "fodder," to distinguish it from other kinds of coarse grass, which are called "stover." Immense tracts which were formerly overflowed are now covered with this plant, which, from its strong stem and upright growth, is suited to places unfit for the finer grasses: there is also a variety, known as *poa fluitans*, or flote poa.

Some of these have in many instances been sown among the grasses recommended for laying down meadows, and in most wet soils, they deserve attention; for, on land where they thrive, they produce a great abundance of valuable fodder. There is, however, no species of aquatic grass which has of late years attracted so much attention as that called

Agrostis stolonifera, or creeping bent-grass, now more generally known as "Fiorin"—signifying, as we understand, in the Irish language, "grassy," and which much resembles the water hair-grass; but of which there is also a variety called the "broad-leaved bent." This, though formerly well known as a weed, was only introduced to public notice as a cultivated grass within the last twenty years, when it was so highly extolled by the Rev. Dr. Richardson, of Clonfecle, in the county of Antrim, that it soon attracted general attention, and, after minute investigation of its merits by several eminent agriculturists, the Doctor was honored with a medal by the Board of Agriculture. In an account published by the Agricultural Society of the Stewarty of Kirkcudbright, some of whose members visited Dr. R.'s farm for the purpose of examining its qualities, it is described as putting forth a great profusion of lateral strings, like the side shoots by which strawberry increases, and by which it is propagated; but the roots penetrate but a short distance into the soil, thus denoting that its chief sustenance is drawn from the atmosphere, and it is represented—

1st. To grow luxuriantly in low and swampy grounds, which, but for the cultivation of it, would be of little or no value.

2ndly. That it grows in such great quantities in irrigated meadows, which are most favorable to it, that it has been known to produce above four times the weight of any single crop in general reared of any other grass.

3rdly. That all cattle are so extremely partial to it, as to prefer the hay made from it to any other hay whatever; and that, from the length of time which it annually vegetates, it may be used as green food during the greater part of winter.*

It, indeed, preserves its vegetable life so long, that it continues in vigor from the beginning of October, until the end of March, and has not only been actually made into hay in the month of December, but when allowed to lie uncovered in small cocks, it did not rot as common hay would have done. As this, however, is a tedious and troublesome process, it is better to give it to cattle green, upon the soiling system, as it does not admit of being pastured; and it has been found to occasion a great flow of milk in cows, as well as to give it a good flavor and superior richness.†

* Ibid. p. 10.

† Survey of the county of Antrim, part i. p. 250.

* *Farmer's Magazine*, vol. xiii. p. 4. Dr. R. has stated, upon the oath of the person who measured the ground and weighed the hay, "that one portion, not manured the preceding year, produced at the rate of 6 tons the English acre; that another portion, which had been manured, yielded at the rate of 7 tons, 4 cwt. and that when weighed, the hay was dry, rattling, and merchantable between man and man by weight."—Ibid. vol. x. p. 508.

† It has been stated, on the authority of Sir James Stewart, of Coltness, Bart., that the average produce of butter fed, sometimes with 8 lbs. of steamed potatoes, with an unlimited quantity of oat-straw, and at

There is, however, this inconvenience in giving it in that state—that, being a jointed plant, and very tenacious of the power of vegetation, any part of it which happens to be left by the cattle, and is thrown out upon the dunghill, if afterwards laid upon arable land before it is completely decomposed, will there take root, and spread in a manner which renders it very difficult to be got rid of: it has even been thus found to spring up when taken from the hay-rick.

Although it may be propagated by the seeds, yet they are of such slow growth that they are apt to be overpowered by weeds, and the better mode is to plant small cuttings of the grass in the latter end of autumn: fine crops have indeed been obtained which were planted in the middle of December. The land should be drained as well as circumstances may permit; for although it suits a wet soil, and irrigated land, yet the water should not be suffered to rest upon it: the ground should then be well cleaned and pulverized, and the cuttings scattered over the surface, after which it should be very slightly covered with loose earth, or with peat ashes and earth well mixed. These cuttings are prepared in the simplest manner by twisting the strings into loose ropes about the thickness of the arm, and then cutting them with a hedge-bill upon a plank into lengths of about three inches and a half. When the crop comes up, it should be carefully weeded two or three times during the first year; after which there will be no occasion for a repetition of that process.*

We have thus inserted fiorin among the list of aquatic plants, for it certainly thrives best on very wet soils, bogs, and cold clays, or upon land that has been irrigated; and although it can be grown on sand and other poor soils, yet the crops are there very insignificant, and it requires not only a wet soil, but also a moist climate, to bring it to perfection. Its most valuable quality appears to be the green food which it produces throughout the winter; for, on land that is too heavy to admit of turnips, there can be no doubt that it may be rendered a valuable addition to the straw yard. On those peaty soils which abound throughout Scotland and Ireland, and the climate of the latter of which, as well as that of the west of Scotland, favors its production, it may also be considered very advantageous, especially if planted alone, unmixed with other grasses; but in other situations it is exposed to the objection of neither supplying spring-food, nor producing a second crop within the same year. Although succulent and palatable, and shown upon the authority of experiments on the fattening of cattle, stated by Mr. Aiton, to be capable of fatting a stot of upwards of thirty stone, in one hundred to one hundred and fifty days, according to the condition of the animal when put up, with less than fifty pounds of fiorin hay alone, without any other food;† yet this has been contradicted by other details,‡ and its cultivation has not been so generally diffused, even in those situations to which it is peculiarly appropriate, as the accounts originally given of it seemed to promise.

The choice of these aquatic plants must be regulated by the different degrees of moisture in the soil. On fens and morasses, if fiorin should not be chosen, perhaps there is none better, after a first drainage, than the water poa, which, by its spontaneous growth, will afford large crops, and at the same time allow the land time to settle. Such soils, however, consisting chiefly of decayed vegetable matter, require the aid of lime, or some alkaline substance, to bring it into action; after which they may be brought in the regular course of cultivation, to produce good permanent pasture. In situations not quite so wet, the flote fescue, flote fox-tails, and rough-stalked poa may be added; and on land still better drained, the following mixture has been recommended:—

Flote fox-tail,	4 quarts,
Flote fescue,	2 do.
Rough-stalked poa,	2 pecks,
Meadow fox-tail,	2 pecks,
Meadow fescue,	2 do.
Vernal grass,	2 quarts.

The latter, if the land be merely intended for pasture, may be omitted; but if meant for hay, should always be added.*

Winter Grasses.

On sheep-walks, or grass-farms, which are deficient in winter pasturage, Mr. Sinclair recommends the introduction of the following hardy and productive grasses, by the means which we have already stated of scarifying and top-dressing; namely—

Tall meadow-grass, and meadow fescue, The former only on very heavy land constantly fed by cattle; and on sandy soils, one or more of the hard-fescue, smooth-fescue, or creeping-fescue, should be substituted for both the above.	3 pecks.
Cock's-foot,	4 "
Timothy, if the soil be very cold and clayey; and on peaty soils, both species to be sown equally divided,	¾ "
Tall oat-grass,	2 "
Broad-leaved bent, or fiorin,	1 "
Woolly soft-grass, only in cases of considerable elevation and poverty of soil, when it may be substituted for fiorin; and the oat-grass may also be left out, making good the deficiency, however, by a proportionate increase in the other species.	
Pacey's perennial rye-grass	3 "
Burnet,	2 "
Perennial red clover, or cow-grass,	6 lbs.
White clover,	8 "

The quantities of the above have, however, been calculated according to the full complement requisite to form a new and complete pasture—only omitting the dwarf grasses, which are not necessary to be enumerated—but the proportion of

other times with 16 lbs. of fiorin hay, and straw in like manner, was as 55⅓ to 39⅜ ounces, from 6 gallons of milk; or 40 per cent. in favor of fiorin—Farm. Mag. vol. xxi. p. 59.

* See Tracts on Fiorin Grass, by the Rev. Dr. Richardson, and Davy's Agric. Chem. p. 366.

† Farmer's Magazine, vol. xvi. p. 53.

‡ See the Reports of the Counties of Antrim, part i., p. 250; Derby, vol. ii. p. 202; Stafford, p. 72; and Dumfries, p. 256.

* Comm. to the Board of Agric., vol. iii. p. 445. Antrim Rep., part. i. p. 249.

seeds which may be required to fill up the old sward with plants, must, of course, depend upon its deficiency in the different grasses: the full quantity of seed required for an acre, being about four bushels. The meadow fescue, and tall oat-like soft grass, and meadow cat's-tail, being, however, with the exception of fiorin, all plants of a later habit of growth than the others, and the greater part of them sending up a second, or a third growth of perfect herbage, sufficiently point out their superior value for winter keep.*

The state of vegetation throughout winter, depends much upon that of the atmosphere about the beginning of the season. If it commences with a sharp frost, unaccompanied with snow, it nips the late spring grasses, and blights all that have not attained maturity, so that they do not again resume their freshness. If it begin with immoderate rains and sleet, it so cools and washes the surface of the land, that a state of decay immediately commences. Mr. Sinclair has observed, that "when the average daily temperature has not materially exceeded 46° of Fahrenheit, the growth of pasture is, to all practical utility, stationary; and when the herbage that is produced under a low temperature, and at a season when the influence of the sun is weakest, is chemically examined, the saccharine and mucilaginous matters, particularly the former, are scarcely one-third so much as in the herbage produced in a temperature, when the sun is nearly at its highest degree." No kind of weather, however, prolongs the winter verdure more certainly than a steady frost, accompanied with snow; for in that dry state of the air, snow affords a protection to immature plants, which, under its cherishing cover, acquire somewhat more of solidity and ripeness.

Grass Land

Of every kind may also be improved, by merely combining the seeds with a top-dressing of compost, or by simply harrowing in the seeds at the proper season. The first method requires the smallest quantity of seeds, and they will be more productive during the first year; but by the latter, a greater extent of pasture may be sown, and at a less expense.

In the *first mode*, the top-dressing, before being applied, should be reduced to a finely divided state, and should, if possible, consist of such materials as will improve the texture of the surface-soil, as well as possess the essential principle of enriching it: thus one-half spit-dung and one-half sandy or light earth, partly road-scrapings, coal and wood ashes, scourings of ditches, and dry pond-mud, previously mixed with hot lime, and frequently turned during several months, have been used with success. The hot lime is, however, only to be used in the composts of ditch and pond-mud, in which it is absolutely necessary, in order to bring those substances into action. The compost being thus prepared, and in such a medium state between moisture and dryness as to crumble freely under the spade, is then in a fit condition to be mixed with the seeds; but this should be delayed until the day of sowing. They are best mixed with top-dressing by passing both at the same time through a coarse wire sieve; and, after a little practice, two men can prepare a large quantity in one day. It ought not to be less than ten cubic yards per acre.

The sward must be prepared for the reception of the seed by an ample harrowing, or coarse scarifying, so effectually performed as to bring the dressing into complete contact with the soil; and the operation, so far from injuring the old turf, will be found to benefit it. Rolling, however, unless the land be very light, is not necessary, and, if the ground be in a damp state, may be attended with mischief. The best season is any time in March, or early in April, according as the state of the weather and the nature of the soil admit of the most effective working of the harrows or scarifying. If, however, the pasture be laid up for hay, the older grasses will greatly injure, or perhaps overpower the seedlings; the proper course is, therefore, to pasture with young cattle stock, and to keep off sheep during the first year.

In the *second mode*, the grasses by which the turf is to be renovated, are, as we have already stated, introduced by merely scarifying the surface in the former manner, but to the full, if not greater extent; and it is equally essential, that all stagnant water be carried off by drainage. The seeds should, however, be furnished in rather larger proportion, because the powers of vegetation are lessened by the want of the top-dressing; but the time of effecting the operation should be in all respects, the same as in the first method.

"As every different soil produces grasses peculiar to itself, and as no other kinds can be established or cultivated upon it without first changing its nature to resemble that which produced those species which we wish to introduce, it becomes a point of the first importance in making experiments on different kinds of the numerous family of plants, and stating the results, to determine with sufficient accuracy the nature of the soil, or different soils employed, and to describe them accordingly." It may therefore be here almost unnecessary to repeat, "that the basis of every improvement in the cultivation of grasses is, to sow the seeds of those species only, which are adapted to the soil: or, to change the nature of unsuitable soils to that which is fitted for the growth of grasses deemed more desirable; and unless this point be in the first place ascertained, and fully attended to, disappointment, rather than success, may be expected to follow the labors of the farmer."* In this we entirely coincide with the respectable author whom we have just quoted; and we also admit the justice of another remark made by him,—"That agriculture has been much discouraged by the injudicious writings of those who invidiously hold up empirical practice as comprising everything to be desired, or sought after, as a guide in conducting the operations of husbandry, and at the same time by insinuations and affected sneers, endeavor to bring the service of scientific knowledge into contempt." Yet we must take leave to put our readers upon their guard against implicit confidence in the conclusions drawn by him and Sir Humphry Davy regarding the comparative nutritive powers of the grasses as detailed

* Sinclair on the grasses best suited for pasture during winter. Prize Essay of the Highland Society, N. S., No. xx. See also Mr. William Hogg on winter pasturage, ibid., No. xxii.

* Sinclair's Hort. Gram. Woburn., p. 115.

in their experiments; for they appear to us to have been made on far too minute a scale to admit of any just inference respecting their properties in the feeding of cattle. Although a chemical analysis may ascertain the respective proportions of nutriment which each apparently contains, we have yet to learn the effect of the digestive organs in extracting it from the different species; and nothing but experience should satisfy any one regarding their assumed value. We mean to say nothing disrespectful of chemistry, and we make no doubt the science will be gradually brought still more beneficially to the aid of agriculture; but it is a well known remark—that, when chemists dabble in husbandry, they are almost invariably found to be bad practical farmers.

Transplantation of Turf.

A plan was introduced about twenty years ago by Mr. John Blomfield, of Warham, an eminent farmer upon the estate of Mr. Coke, of Norfolk, of laying down land to pasture, by transplanting a portion of old turf in stripes or pieces, in the same manner as sods are usually laid for lawns, at certain distances from each other, leaving the other parts uncovered, whence they afterwards extend their roots, and become one united sward. The operation, as described by Mr. Blaikie,* from whom we have partly extracted it, commences in autumn, as soon as the turf, which is intended to be removed, is sufficiently moistened by the rains, so that it can be pared off clean, and without injury to the plants: or as soon as the farmer can spare his teams and laborers after harvest.

A clean, sweet old turf, of the best description, is then chosen, and cut with the common breast plough, or with any of the implements used in paring and burning,† into slips of about two inches and a half in thickness. These are also sometimes cross-cut with a scarifier, heavily weighted, so as to press the tines to a proper depth into the turf; or they are carried to the field intended to be laid down in large flags, then set in straight lines at regular distances, and chopped into pieces about three inches square, and placed in the manner hereafter stated.

A harrow, or a scarifier, with round or square tines, about an inch and a half in diameter, and set about seven inches and a half apart, or four times to the yard, is, however, first drawn regularly over the field at right angles; thus marking out the distances for placing the pieces of turf, and making an opening for their reception at those angles where the tracks of the times cross each other. Women and children are then employed to place the pieces with the grass side uppermost, and as they plant each separate piece, they press it into the ground with the foot; or, if any difficulty should occur through the hardness of the ground, a common wooden hand-rammer may be used. Particular attention is, however, requisite to this part of the process, for if the roots of the plants are left exposed to the weather, they will be materially injured. The whole process should, therefore, be executed with all possible expedition, especially when carried on towards winter; for, as frosts may occur at any time during that season, no more turf should be cut, carried, and spread in the day, than is likely to be laid before night; and no greater extent should at any time be undertaken than there is a probability of completing perfectly.

An acre of old turf, thus divided into squares of three inches, will plant nine acres of arable;* but although this is the most common, and generally considered the most proper size for the pieces, and the distances for their being set apart, yet if not convenient to spare so much old sward, they may with safety be placed still wider. It is also evident, that no part of the old meadow need be wholly destroyed, as narrow stripes of turf may be cut from it at such moderate distances as will insure the blank spaces being afterwards filled up with a fresh growth. It has, indeed, been found to improve rather than to injure sward which was previously hide-bound, or mossed, in the same manner it would as if scarified: it should, however, have a good top-dressing, be replenished with the seeds of those grasses in which it may be deficient, and be well rolled.

The expense of this mode of converting arable land to pasture has been stated by one of the claimants for a premium, offered by Mr. Coke, for the encouragement of this species of husbandry, to be about 2*l.* 9*s.* 3*d.* per acre, according to the following account.

	£		
Paring 1 a. 2 p. 18 f. of turf, at 10s. per acre,	0	16	2
Carriage of 600 loads of turf, fifty days work for one horse, at 3s. per day,	7	10	0
Lads driving carts,	0	19	8
Scarifying 11 a. 15 p., at 2s. 6d. per acre,	1	7	9
Laborers filling, cutting, spreading, and planting the turf on ditto, at 30s. per acre,	16	12	10

It must, however, be observed, that there is no allowance made for the year's rent and taxes, or for the expenses incurred by the previous summer fallow of the arable land, nor any charge for restoring that from whence the turf was taken; the real cost should, therefore, be stated at considerably more. With the view, however, of lessening this outlay, some experiments were made at Holkham, under the immediate inspection of Mr. Coke, for the purpose of ascertaining whether crops of corn or pulse could not be sown at the same time as the transplantion of the turf, without injury to the future pasture, and in this we learn that he has partly succeeded. A piece of arable land, which had borne a crop of Swedish turnips, was ploughed, harrowed, and transplanted with turf in the month of March, and four bushels per acre of Poland oats were sown broadcast at the same time with some clover; the seed being scarified in before the turf was planted, and the whole afterwards lightly rolled. The result was, that the oats produced a crop which was estimated at six quarters per acre, and were reaped without injury

* On the Conversion of Arable Land into Pasture, 3d edition.

† For which see chapter xvi.

* Thus—"One acre cut into pieces of three inches square will produce 696,960 plants. One acre of arable marked out in squares of nine inches to the side of the square, or eighty-one square inches, and one plant to each square, will require 77,440 plants, each standing six inches apart, and occupying nine square inches of space."—p. 17. *One* acre of turf to *six* of arable is, however, a surer proportion.

to the young pasture, although the bottom was full of grass; but although quite covered with plants, yet fewer of them perfected and shed their seeds than in two other experiments, in which Heligoland beans were dibbled along with the turf.

From the Genesee Farmer.

ECONOMY IN FEEDING WITH HAY.

With many farmers it is considered sufficient that horses and cattle are fed with hay once, or at most twice in twenty-four hours; and they would probably object to the trouble and labor of feeding them more frequently. They ought, however, to reflect, that the injury which fodder sustains by the breath of the animal constantly blowing and condensing upon it, thus rendering it disagreeable and liable to be rejected and wasted, often occasions a loss, which greatly overbalances the trifling saving of labor and trouble. Some farmers think that there is no danger of animals suffering from hunger so long as there is plenty of hay before them: but if this hay has been lying a day under their breath, it will be found to have become so disagreeable and loathsome to them, that they cannot be made to eat it freely, without actually starving them to it. What farmer is there, who would be willing to eat a dish of food, the surface of which was covered with the gathered condensations of the breathing of twenty successive hours? Not many.

It ought, therefore, to be a rule with farmers, to give little hay at a time, and repeat it frequently, taking care at the same time that what was last given be consumed before any additional supply is offered. By this management, none of the fodder will be lost, and the animals will derive the advantages of having fresh and wholesome food, for which they will at all times have a good appetite.

There is another point of economy which is well worthy of attention. It is not an uncommon occurrence, particularly in wet seasons, and often in consequence of bad keeping, that a considerable quantity of hay is more or less injured, so that cattle do not eat it freely, and it is frequently thrown aside as *bad hay*. Now cattle may often be made to eat this readily, and without any injury to themselves, by wetting it with brine, which not only renders it agreeable to the taste, but also has a beneficial effect on the animals, particularly in winter, when salting is apt to be neglected. In performing this operation a quantity of brine no greater than is sufficient to render it moderately damp should be applied, or else it will be unpalatable. The same effect will be produced if the brine is too strong. It may be conveniently applied with a common watering-pot. In mild weather, a considerable quantity may be prepared at a time, by sprinkling successive layers of hay and leaving it in a heap, but it should not be allowed to ferment. The moisture thus becomes equally diffused through every part, and it is in a better state than when freshly brined. In the same way, *straw* may be rendered very palatable for cattle, generally quite as much so as common unsalted hay.

From the Southern Agriculturist.

SALT AS A MANURE FOR COTTON.

Mr. Editor.—Will you do me the favor to inform me, whether you have ever used salt as a manure for cotton?—if so, how is it used, and in what quantities? I have been for some years back using the salt-mud, and salt-marsh, with the greatest success; and every one who has tried them can testify to their excellenee, as a check to too superabundant growth.

If you can answer my queries, Mr. Editor, or if you can get some of your correspondents to do so, you will confer a favor upon

ONE INTERESTED.

St. Andrew's Parish, Dec. 12, 1836.

Answer.

We have been giving the subject, about which "One Interested" inquires, the most diligent investigation; and we are happy that it is in our power to offer the desired information.

Common salt, as a manure for plants, has been long known to agriculturists in Europe, and in this country. Its properties are however, as a stimulant, and not as a nutritive manure. Count Chaptal, in his admirable work on "Chemistry applied to Agriculture," lays it down that, it is in this manner that salt always acts upon the plant; and the experience of every planter bears evidence to his position. What spices and pickles are to man, salt is to vegetables. It serves to increase the appetite of the plant, to invigorate its digestive organs, and to give a healthy tone to all of its functions of life. By combining with the aliments of the plant, and by carrying on an uniform decomposition, it gives a more regular supply of nutrition.

Acting, as salt does, purely as a stimulant, it should, consequently, be supplied only in suitable proportions. If it is supplied in too large quantities, it will be absorbed by the organs of the plants in such a manner as to produce irritation and dryness; and it is in this way, that the best soil is sometimes stricken with barreness.

But to the point in question—how much salt can be used without injury; and in what manner?

The Honorable Whitemarsh B. Seabrook, of Edisto Island, informs us, that for two or three years in succession, he tried the experiment with salt as manure for cotton. The salt he made use of was common rock-salt, well pounded up; and the land upon which it was applied, if we recollect aright, was of a light sandy nature. He applied it to the task row (105 feet) in quantities from one pint to one quart. The result was as follows: The row manured with one pint of salt produced excellent cotton, which from its germination to its maturity, assumed a healthy and vigorous appearance. The cotton bore well, and its staple was strong, and the seed well covered with wool. Wherever a larger amount than one pint was applied, the plant went through the process we have supposed in our general remarks. It grew luxuriantly at first; but, before maturity, it became dry, and seemed gradually to die away with thirst.

As nearly as we can recollect, it was the opin ion of Mr. Seabrook, that unless the soil was naturally good, it was best to apply the salt mixe-

with compost or stable manure. This agrees with the practice laid down by Chaptal and others. Indeed salt, like all other stimulating manures, must have something to act upon. To assume the comparison which we have already used, like the human appetite after being excited by spices, it must have good wholesome food to nourish it.

In addition to the information afforded by Mr. Seabrook, several gentlemen on Edisto Island have made similar experiments, with the same success. Though few of them have applied salt in its unmixed state, they have, most of them, applied it when mixed with compost and other nutritive manures. As to its effects, all seem to agree, that it acts beneficially upon plants; and more so, perhaps, upon the cotton plant than upon any other.

That it has a direct tendency in producing fine cottons, is abundantly testified by circumstances within the observation of every one who knows anything of that plant. We must all acknowledge, that, the farther removed from the salts the soils is, upon which the cotton grows, the more it deteriorates in quality. Dr. Ure, of England, who has written an interesting work on the cotton manufacture, and on the natural history and husbandry of the plant, once made an experiment upon two parcels of cotton, to see what quantity of salt they each contained. The first was upon 5 lbs. of very fine sea-island cotton, which had brought 6s. in Liverpool: the other was from 5 lbs. of a coarser cotton of the same sort, which brought only 4s. Both of these were burnt, and the salt separated from the ashes of each. We have not the exact result of the experiment before us; but we recollect, that, the ashes of the fine cotton contained a much larger proportion of salt than that of the coarser. From this experiment, and similar others, Dr. Ure was persuaded, that a due proportion of salt entering into the plant, always improved the staple of the cotton.

If these facts be correct, and no one can doubt them, does it not behoove our planters to give the thing a trial? Salt can be readily purchased, at 50 cents per bushel; and if the sweepings of the cellar are purchased, it can be had for much less. At the rate of 1 pint per task-row, 10 quarts and a half (allowing 21 rows to the task) will manure the task, and a little more than a bushel and a third will manure an entire acre. Let our planters consider this matter well; and let them make the experiment.

Before concluding, we would mention one other practical instance of salt having been applied with success to cotton. The late Wm. Edings of Edisto Island, from a barrel filled with sea-water, watered a portion of his field, after listing in the land. The water was poured upon the list, so as to saturate it moderately. The cotton grew well and bore well; and he often assured us, that nothing prevented his making a general practice of the experiment, but the want of proper carts to carry the water. We mention this experiment, not that we would advise its adoption, but only to add another proof of the beneficial effects of salt when applied as a manure. When we take into consideration the small expense of this manner, the ease with which it may be applied to the land, and its undoubted beneficial results, we predict that its general adoption will produce the same effects upon the agricultural interests of this state, that the introduction of calcareous manures have done for Virginia.

EDITOR OF S. A.

From the Memoirs of the Philadelphia Agric. Society.

ON RECLAIMING MARSH LAND.

By R. G. JOHNSON.

Salem, N. J., Feb. 10, 1819.

Sir—Being disposed to submit my observations and experience in practical agriculture, for a period of twenty-eight years past, to the perusal of the readers of the "Memoirs of the Philadelphia Society for promoting Agriculture," I shall be sufficiently gratified should any thing be gleaned from what I have written, which may tend to throw some light upon a subject connected with rural economy, and which in some parts of our country, is but imperfectly understood; I mean the reclaiming and bring into a dry and profitable state, the numerous wild marshes, which line our bay, river, and creeks.

The wild marshes are made from the sediment carried on them by the flowing of the tides, and deposited among the different species of wild grass, which every season spring up, and in the autumn decay, and then become incorporated with the sediment of the preceding year, mixing with the various putrescent animal and vegetable substances of which the quagmire is composed. From this mass is produced a soil, which, when brought into good cultivation, continues its extraordinary fertility for many years. I have observed, that on such marshes, the line of distinction may be easily traced by the effects of the salt, and the brackish water, upon the numerous species of aquatic plants which grow thereon. As far up the Delaware as Reedy Island, grow two species of salt grass—the rosemary salt-sedge, and the red salt-sedge, and two species of reeds; from thence, to about the mouth of the Christiana Creek, or Deepwater Point, grow the three square, the two kinds of reeds, and fresh rosemary; and from thence up the river, (the water being fresh,) grow the bull rush, three square, only one kind of reed, wild oats, flags or cat-tails, fox-tail, spatter dock, and the water lily. For bringing into cultivation such unproductive marshes, the universal practice throughout our country (until a few years ago,) was, to dig a ditch parallel, and about six feet distant from the footing of the intended bank, and from that to make a bank of such form and size as accorded with the judgment of the owner. After the bank had stood a year or two, it became apparent that it had not only settled, but that the foundation had inclined towards the large ditch. To keep up the bank to its proper height, it was then thought necessary to dig a ditch about ten or twelve feet in the inside, and pack that on the bank; but even this method did not permanently remedy the defect. The evil of such proceedings was apparent, because the foundation could never be made sufficiently firm to support so great a quantity of mud, without settling so low as to admit the tide overflowing the same, unless frequent additions of fresh mud from time to time were made to keep it up to its former height; and even then the expense

and difficulty have been increased, in consequence of the scarcity of mud, both within and outside of the bank, and of the great pressure of mud forcing the foundation into the ditches. Another very serious evil was, that these ditches afforded an easy and safe passage for the muskrats and fidlers to enter at all parts of the bank, and thus admit the water, so as frequently to break it.

Tide Bank.

In the present improved method of reclaiming wild marsh from the tide, the first thing to be done is, to stake out the site for the intended bank, at such a suitable distance from the margin of the river or creek (as the case may be,) as to allow a sufficient space for a guard against the swells of the water in stormy weather, and for the preparation of mud to make and keep in repair, at a distance not near than four rods from said bank. Should the marsh be composed of a mat of sedges or reed-roots, (as a preparation for the intended bank,) the laborers should remove one spit deep of the roots, and lay them aside to be packed on the bank when nearly finished.

The trenches from whence the mud is to be taken, are to be served in the same manner, because such hard sods can never be sufficiently packed, but that they will admit the water. The surface being now removed, they will proceed to cut and wheel the good mud into the bed designed for the bank. To do this properly, it will be necessary that the laborers should be apportioned to the different parts of the intended bank in separate gangs, as the work will then be carried on to the best advantage, not only to themselves, but their employers. A gang is composed of five hands, two to cut and load the wheelbarrows with mud, two to wheel it to the bank, and one to be there stationary as a packer. The business of a packer is to lay out the bank, pack every sod of mud that is delivered to him by the wheelers, and attend strictly to the carrying up the bank, in its true proportion and proper height; he is also to assist in making the gangways to run the wheelbarrows on. As to the size of the bank, the owner must be governed entirely by circumstances; if his marsh is situated upon a water subject to freshets, which swell the tides beyond their ordinary level, or, is of a spongy or miry bottom or, if lying on a losing shore, or subject to be beaten on by particular stormy winds, which raise the tides; in any of these cases he must build and fortify his bank accordingly; but if free from those liabilities, and his marsh high and of a firm blue mud stratum, in that case, I should suppose a bank of twelve feet base by six feet in height, would be sufficient: but I would observe, that I have never seen a bank too large. Let the bank be of what size the owner may choose, I have always considered that the base should be double the width to the height, and as to the sides or slope, they should be at or about an angle of fifty degrees, and the breadth at the top of the bank about one sixth of the base. To wheel mud on a miry marsh, it is necessary the men should have boards to lay upon the mud, but in wheeling their barrows to the top of the bank (which would be an elevation of six feet,) they must have plank of not less than thirty feet long, though the longer they are the better, provided the men can handle them, and they should be not less than four inches thick. To support the plank in the middle, they should have several light posts with holes morticed in them, through which a rail or pole is temporarily inserted, so as to bear it with the weight of mud passing over, and also to prevent it from swagging; these posts will be removed, and the wheeling or gang-plank, as it is called, must be removed several times before the laborers complete a single rod.

Sluice.

The bank being finished, a suitable place must be selected for laying a sluice, which should be several rods distant from the creek or river, into which it is to discharge the water from the marsh. In the preparation for the intended bed of the sluice, the water course should be begun from the margin of the river or creek, and its depth continued at about the ordinary low-water mark, until the bed of the sluice is cleared, when the digging should be suspended until the sluice is bedded and finished. The mud on each side of the intended bed should be removed a reasonable distance, lest, when piling for the sluice, any sudden jar might cause the sides to cave in, and thus fill up the bed. After the bed is dug, four stakes, having lines fastened to them, are to be drawn taught, and stuck into the mud exactly on the bottom, where the sluice is to be laid, but within the breadth of the sluice by about two inches; for example, should the sluice be four feet wide, then set down those stakes at the distance of three feet nine or ten inches apart. In the mean time some person should be in readiness with the pilings. These pilings are made from inch boards (no matter of what wood, for in the mud they never rot,) sawed off, to the length of about three feet, and are to be sharpened; this is done by a person cutting and sloping away both sides of one end of the board alike, and by cutting off three or four inches of one of the corners, at an angle of about forty degrees. These pilings being set by the lines, are driven down to a level with the bottom by a maul or tip, beginning at one end, and so proceeding on, until both sides are completed, and by crossing the bed in several places and immediately under the in and out end of the sluice, always remembering that the piling be put down with that edge having the point cut off furthest from the board last driven; so that in forcing it down, by the time it will be brought to a level with the one preceding, it will be drawn perfectly tight against it. Should the sluice be made of two or three funnels or divisions, you must drive as many rows of pilings as there are divisions of plank. If the mud is good where the sluice is laid, by piling in this manner, it can never settle, and no muskrat or mink, can ever undermine it. The piling lengthways and across being completed, and the lines removed, four poles eight or ten feet long, are to be set down by the four corners of the pilings as marks to direct the workmen to the exact place into which they are to float the sluice, and excite their attention to those parts as it settles on the ebbing of the tide. When the sluice shall have grounded on the pilings, one of the workmen is to examine if it has rightly bedded, and if so, they will then proceed and cover it up with the best mud, care being now taken that a trusty packer be stationed there, to pack every spit of mud as

it is delivered to him. It will now be necessary to lay two logs across and resting upon the front and in-ends of the sluice, with their ends bedded in the solid marsh, so as to prevent the mud as it is packed on the sluice from slipping out, and to prevent muskrats and other vermin from burrowing at or near its sides. It will also be necessary to have inch boards sawed to about six or eight feet in length, to be pointed and sharpened in the same manner as directed for the pilings. The laborer standing sideways to the log, with his face towards the sluice, must set the edge of the board against the sluice and perpendicularly against the log with the cut off corner of the board next to himself; two other men must have a two inch plank in readiness, and while one of the ends rests on the mud, the other is placed by the man attending the piling, on the top of it, who are to hold it steady while the two men walk on the plank until they come over the piling, when, by raising and sinking themselves, they force it down with great facility. This method is continued until these logs are piled from end to end. It must now be obvious even to a person unacquainted with such business, that if a sluice be laid and secured in this manner, nothing can injure it. For three feet under low water mark, it cannot be unmined, being, as it were, a tight board fence, and for more than half-tide up, an equally impenetrable barrier against any kind of vermin.

The duration of a sluice of good materials, and well laid, may reasonably be computed at thirty years. From my own observation, I am decidedly of opinion, that sluices should always be preferred to flood gates. My objections to a flood gate are, 1st. Because the cost is more than double that of a sluice. 2d. A flood gate, on the average, will not last more than from ten to twelve years; while a sluice will last from twenty to thirty years. 3d. A flood gate is frequently out of repair; from the construction of a sluice, it can seldom want any thing done to it, and when necessary, it is easily repaired. 4th. Should a muskrat work a hole under the flood gates, and they blow out, they are good for nothing. Should a sluice blow out we have only to make a counter dam, and relay it on the same bed, or dig another close to the one on which it before rested, and there lay it. The sluice is just as good as before the blow out. These are my reasons for giving the preference to the sluice.

Description of a Sluice.

A sluice is a trunk on an enlarged scale, for the constructing of which the usual way among farmers is to cut down a large tree, and by reducing its sides to the thickness of from ten to twelve inches, it is hoisted up, and slit through by a whip-saw, which forms the two side planks for the sluice, each being about eighteen or twenty inches broad, and in length from thirty-five to forty-five feet. These planks are then set up the width intended for the sluice, (usually about four feet,) and covered over with good two-inch plank, well secured with inch wooden pins. The door is made of two-inch plank also, and hung within these side-planks about six feet from the mouth. The method of hanging the door is, by pinning two pieces of scantling, three by five or six inches, to it; and a like piece upon the top of the sluice over the side plank, and through these four pieces of scantling to bore a two-inch hole, through which is passed a good wooden pin or iron bolt, to hold the door securely, and permit it to open and shut easily. The advantage of hanging the door a little within the sluice, is to prevent its being injured by the ice, or by pieces of floating timber, and by admitting the discharge of the water more freely from it; for in leaving the sluice it glides away in a smooth current; whereas, if the door was hung at the mouth, the water would pitch down and wear a deep hole immediately on its leaving the mouth. If it should be thought necessary to have a large sluice, say six, eight, or ten feet wide, the division plank must be increased to the number of intended funnels: thus, if there are to be three funnels, then there must be two division planks, and so on.

Flood Gate.

Tho flood gate is constructed of sills, ties, caps, posts, and studs, all morticed and tenanted into each other, in the same manner as any ordinary frame building, by having its bottom planked tight, and its sides boarded up, with its door or doors hung to the posts, in the same manner as a common stable door. Now it must be obvious to any person, that so much wood work, exposed to the alternate operation of wet and dry, must, in a few years, give way; while the sluice which has been well laid, and is never dry, will, of course, resist the effects of decay for very many years.

Creeks and Dams.

It sometimes happens in large tracts of marsh about to be reclaimed, that there are creeks of considerable width and depth, with a strong tide setting through them, and although the sluices may have been laid, and the bank completed, and that too at a very considerable expense; yet, until they be safely dammed out, nothing can be said to have been done effectually. No business in the whole circle of agricultural science, appears to me to be of more importance, than a knowledge of the mode of constructing a perfect dam of magnitude upon a mud bottom, over a deep and rapid creek of tide water. The method which I have found to be the best, I will take the liberty of recommending to others. In the first place, I proceed with a hand or two in a boat at low tide, and carefully measure, and note down the depth of water at every eight or ten feet, until I have ascertained the exact depth from shore to shore, as well as the distance across. Then all necessary timber is provided, and worked so as to suit the different purposes for which it is designed; all such posts and other timber as may be wanted for a day's work are put on board of a large scow, or other vessel capable of the service. Having proceeded to the site intended for the dam, stakes are to be set up on both sides of the creek, the tops of which must be at least two feet above the intended summit of the bank when finished. With sheer-poles and tackle, we proceed to set down a post by lowering it into the mud, and then forcing it down to its proper depth, either by a man hoy, as it is called (being a large block of wood,) worked by hand by the men; or if that be not convenient, by having a large log chained with one end to the top of the

post, and the other end resting on the boat, and by the assistance of half a dozen men, jolting up and down on it, the post is soon driven home; another is then set down opposite the last, and when done, they are secured to each other by a large piece of timber called a cap, morticed to suit the tenons of these posts, and raised up and put on them. Thus the labor of setting, driving, and capping these posts is continued until these two rows are completed. After that, a single row of long slim logs, (I have used many from fifty to seventy feet in length,) are to be bolted to the inside of these posts, so near low water mark as the work can be performed. And here I would observe, that all pieces of large timber used in the construction of the dam, and which cross the current, or run parallel with the dam, are called ties. All pieces of timber that cross the dam and rest on the posts, are called caps. All pieces of large timber driven into the mud, and connected by caps, are called posts. All small timber that a man can handle, such as poles, boards or plank, which are forced down by the weight of men into the mud to secure it from slipping, are called pilings. The long ties being bolted to the posts, prevent them rocking about by the rapidity of the current; and they are also the main support to the tops of the pilings which rest against them, and confine the mud to its proper place. Another set of posts, much shorter and lighter than the former, are driven midway in the space between the large posts, and pressed hard against and inside of the long ties. Opposite to these, and furthest from the long posts, other short and light posts are driven down and capped, on a range with the surface of the marsh. These outside posts are secured by a single row of long ties bolted to them; a second row of long ties are then put on the inside of the large or middle rows of posts, and directly over the in-ends of the caps of the outer posts, forming for these two middle rows of posts two complete rows of long ties, which are bolted to the large posts, and the in-rows of small posts are bolted to these long ties. Thus there will be three distinct apartments or spaces for the mud, and four separate rows of pilings to secure it within, so as to receive the body of the dam to its proper height in the middle apartment or space between the high posts, while the two outer spaces are to be considered as supports or footings to the whole; so that by packing the hardest mud in these outer spaces against the pilings of the inner rows it is apparent that the whole pressure of the weight of mud will be directly downward; nor can the body of mud incline either to the right or left of these middle rows of pilings, because a like quantity of mud being thrown into each of the outside spaces, will produce a like pressure upon the centre of the dam. For these pilings I would prefer two-inch plank, sawed to suit the varying depths of the water, because they are more easily pointed and more quickly driven to their proper places by three men using a plank, as prescribed in laying down the sluice. In filling up these spaces, (particularly the middle one,) it will be necessary to observe that no more work is to be laid off for the day than can be secured and completed, so that it may not be swept away by the current at night. In doing this, no greater distance along these four rows of ties should be piled than can be filled up by the hands during the day; and as preparatory to filling up the day's work, three light ties or sticks of timber, about six inches in diameter, and of length sufficient to reach across each of the three spaces, should be laid across the long ties and rested for support against the posts. Within and against these moveable ties, good plank should be stuck down close to each other, and as much mud should be thrown within, as would support them firmly to their places, and enable them to resist the impetuosity of the tide. Without these precautions, the rapidity of the current would carry away the mud as fast as it was thrown in. This process, called cribbing, is necessary to be repeated at every lay-off of the work. From these cribbings, in the middle space, the mud is to be sloped backward, towards the top of the bank that had been previously finished; and before these cribbing planks can be safely removed, there must be another set of cribbing planks put down, and the four rows of long ties piled all in the same manner as the former. Thus we continue to draw up these cribbings next to the bank, and advance the new cribbings as the work progresses, until the breach be completed. To accomplish such work to the best advantage, substantial wheeling plank should be laid over the middle row of caps, for the men to run their barrows on in safety; and when it is necessary to bring their mud from a greater distance than about eighty feet, another gangway should be formed, that all the loaders (or, as they are sometimes called, shovelmen,) may be kept constantly at work. There should be two sets of wheelers for one set of shovelmen; one set of the former to wheel up the mud half way to the dam, and there to meet the other set returning with their empty barrows. At this place they exchange their barrows; those who came up loaded, return with their empty barrows to be again filled, while the others, turning about, proceed to discarge their loads in the breach. That all parts of the work might advance aright, there should also be two large flat-bottom boats, (scows,) which could be very advantageoutsly employed; the one within the dam in the creek, and the other on the outside, with hands sufficient to work them. Their business should be to bring mud from the sides of the creek, and discharge their loads into the two outer spaces, viz. the footings, by throwing the mud with force against the pilings of the two inner rows. During all the time that the laborers are employed, a few trusty men should be stationed in the mud at the dam, and should be ordered to pack every wheelbarrow load as it is delivered. Should the mud happen to be soft and inclined to slip, it will then be necessary to spread over it occasionally very thin layers of fine brush, or, what is equally, proper, three-square young reeds, or any long grass. Alternate layers of such materials being incorporated with the soft mud, give it such tenacity, as that the workmen can carry up the dam to its proper height and shape. The width of such a dam would be from thirty to thirty-four feet, and the work when completed would exhibit a view, from the edge of the water at low tide to the top of the bank, a slope at or about an angle of fifty degrees. Before the work of filling up the breach is fairly entered upon, I consider it safest to guard the opposite side by running off a crib, some ten or twenty feet, and securing it by good mud packed within; for as the work advances and the width of the breach lessens, so

in the same proportion, will the rapidity of the current increase. As the work advances, it would be advisable always to let the sluice doors be open to admit the tide into the marsh, and to keep up a pressure on both sides of the dam as nearly equal as possible.

Ditches.

The marsh being perfectly enclosed, and the tide excluded, it is now necessary to have it divided into lots of such size as may be most easily put into and kept in a dry and improveable state. In whatever number of acres the owner may choose to have his lots, they should be so laid off, as that the ditches dividing them should run perpendicularly from the bank towards the centre of the marsh and be not more than from twenty to thirty roods distance from each other in good mud; but where the mud is of a light fibrous texture, (such as is vulgarly called horse dung, or peat,) the ditches should not be more than twelve roods apart. The reason I would assign for such a division is this, that in irrigating such grounds the water can pass with facility along the ditches, and spread its fertilizing qualities through all parts of the meadows; and also by such distribution, the lowest and the poorest parts would receive the greatest proportion of the sediment. Another reason, I even assign, is, that the drier your meadow and better the mud, the finer and more nutritious will be the quality of the grass. It is invariably the case, that you will find the loose or peaty soil in the lowest parts of all marshes, and although it may sometimes produce a tolerable quantity of coarse herbage, or, by good cultivation, a prolific crop of the improved grasses—still none of those productions will be half equal in nutrition, to that grown on good mud. In the divisions of the marsh, let all the ditches be cut eight feet wide by three feet deep; a narrow ditch would be unsafe for the cattle.

Seeding of Meadows.

As soon as possible after the marsh has been enclosed, and while the ditches are cutting, set to work in good earnest to have your grass seed sown. It is all important to have it sown as speedily as practicable. Often have I seen the good effects of early and expeditious seeding of a new marsh, and frequently have I known that a delay for a year or two, has cost a length of time and labor to put in the seed, and even then to very little purpose. Should the marsh have on it a great quantity of wild herbage, no matter, be not dismayed: sow among them, throw on the seed plentifully, and you will in a year or two see your account in it. If any part should remain not seeded when the winter sets in, you may burn off the rubbish, (if you think best,) and commence sowing your seed in February; and that it may be evenly scattered over the surface of the marsh, sow the lots twice, by crossing the first with the second sowing. The roller is always to be preferred for the purpose of beating down the rubbish, rather than destroy it by burning. It is the practice here to sow the grass seed among the reeds, flags and wild oats, disregarding their height. I have been credibly informed a man a few miles from me sowed timothy among a most extraordinary growth of such plants, and who, when the seeding was finished, took a common gate (not having a roiler,) and dragged it over the rubbish until it was flattened down; the rubbish soon rotted upon the moist surface, and afforded an abundant nutriment for the tender sets; the consequence was an extraordinary crop of grass the following year.

I would wish to be distinctly understood, that the seed should be sown on the marsh, while it is yet in its wet state, and before the frost of winter, or heat of summer, should either pulverize or dry the surface; for both these natural causes operating on the surface after the seed has been sown, will do more for the embroy seed just springing into existence, than (in large bodies of marsh,) hundreds, nay, I might say, thousands of dollars worth of labor could effect. After the seed shall have been sown, (and from long experience I can assert,) that the best and only sure way of speedily getting your meadow into grass, is to pasture it, as severely as possible, for the first and even second year. The wild herbage being kept down by the number of cattle continually feeding thereon, will afford the tender grass an opportunity to take root; while at the same time their continued treading of the soil, tends to bury the seed among the loose and decaying rubbish, and to render the surface more compact; for on that depends the growth of the artificial grasses, and the destruction at the same time of the wild plants. I consider as the truth, that the mellower a marsh is made, the less liable are grass seeds to take root, (although directly the reverse is the case in upland,) or, if they should happen to take root, they might vegetate for a while; but, when the heat and droughts come on, they will most assuredly perish.

Different marsh soils require different kinds of seed. The firm blue mud is best adapted for green grass, timothy and the clovers, particularly the white. The light spongy marsh (called horse dung or peat,) is fitted for none other than the herdgrass. Immediately after the bank is completed, this kind of soil should be sown with herdgrass, while it is yet new and in its wet state, and before it has time even to exhibit dryness on the surface. While it is yet wet, a sward of herdgrass may be formed upon it, and by pasturing it closely for some time, it will then be useful for mowing for many years. I would never recommend the sowing of herdgrass on good mud, because the timothy, clovers and green grass, are all far preferable, much more nutritious, and bear pasturing until quite late; on the contrary, the herdgrass is not so good for pasture, nor will it resist the effects of a late frost in the spring, nor an early one in the fall. Besides, it has a wonderful tendency to root out all the other grasses, with its innumerable long and very fine roots, and from the production of such an immense quantity of seed, which are so easily shattered out and wafted by the wind every where; that should but a very small portion of the seed be mixed with the other grasses and sown on blue mud, it would be discovered in a very few years, that the herdgrass had obtained the complete ascendancy. The herdgrass is admirably adapted for the salt marshes. It is wonderful how easily it can become the companion of even the red salt grass; and in proportion as it acquires strength and root, so in the

same proportion does it take the place of that natural proprietor of the saline soil. When I speak of salt marshes, I wish to be understood, those marshes which are considerably brackish, but not so much as those bordering on the ocean. It is asked, what method should a farmer adopt, so as to render a light peaty meadow more compact? I answer, the only probable and sure way would be, to fodder his cattle throughout the winter on it: for their treading would have a tendency to consolidate the surface, and to cause a much thicker growth of young grass the following spring. It may appear incredible to those persons who are strangers to this kind of marsh, when I tell them that a mass of such peat or horse dung mud, as large as a hogshead or wagon body, exposed for a few weeks in summer to the sun and winds, would take fire as soon as it was applied; or if thrown into water, would float as light as a cork; yet, extraordinary as it may appear, (if proper care be taken to get a sward of herdgrass upon it,) it would astonish the beholder to view the abundant crop. The innumerable roots of the herdgrass, while they obstruct the rays of the sun, and the winds from penetrating the surface, at the same time shut in and retain the moisture for their own benefit; yet, if cultivation in proper time should be neglected, this kind of marsh will finally become so very light and porous, that a man in attempting to walk over it would sink to the depth of his ancles. Am I asked by what method are meadows to be continued improveable, so that they may be rendered capable of yielding considerable quantities of grass by the ordinary resources of any practical farmer, and that in the most easy and least expensive way? I answer, by *irrigation* in three ways: 1st. Partial. 2d. Effectual. 3d. Internal.

Of Partial Irrigation.

When meadows have been some time in bank, it is always to be presumed that a considerable portion of them have been brought into good grass, and that even the very high parts may have become too compact, or (as it is called by the farmers,) bound, to yield that productive burden which might be expected from them; wherefore, that the surface of the meadow might again be vivified, or, as it were, brought to life, from that dead state in which it is commonly said to be, when bound, recourse should be had to irrigation. It is a common practice with some of our farmers to let the water on their meadows about New Year's day, and so continue it until the vegetation shows itself in the spring, and when drawn off the surface, they often have the appearance of a beautiful green wheat field. Preparatory to irrigating, the sluices should have doors hung to their ends, so as to admit the tide, and, by shutting down, to prevent it from running out again. There should also be a number of trunks made from two to three feet square, and a few feet longer than the width of the bank; the number of these trunks should be in proportion to the number of acres to be irrigated, say one to about thirty acres. These trunks are laid in the tide bank opposite the highest parts of the meadow, and on a level with its surface, so that every flood might pass into it from the different parts of the bank at one and the same time, through these trunks and sluices; and on every ebbing of the tide might leave its sediment incorporated with the dead and decaying vegetables of the surface, which, by its daily increasing in quantity, augments its weight upon the falling rubbish, and with it affords the richest nutriment to the expected crop of grass. That a farmer might have the benefit of the early crop of good grass, such as timothy or green grass, which might be cut in all the month of June, and also improve the more inferior parts of his meadow by sowing grass seed on such parts as had not taken, he could, on or about the first of July, let the tide on them by the above method, and continue the process until the first of April following. He would then find, that where the rubbish had grown in the greatest quantity, and been beaten down by various causes operating on it, there the sediment (becoming incorporated with it,) had formed a new soil three or four inches in depth completely adapted for the reception of grass seeds.

This would be the proper time for the farmer to profit by his former mistakes, (in delaying to sow his marsh when first reclaimed,) by immediately drawing off the water, and casting his seed with a liberal hand upon the slimy surface of this new formed stratum, composed of putrefied vegetables and mud; nor let him forget, as the vegetation advances, that, for insuring a good crop of valuable grass, he must have a stock of cattle, the number of which ought to be in proportion to his acres, so as to keep down the superfluous growth of the wild plants.

Effectual Irrigation, or Drowning the Marsh, as it is called.

After a meadow has been many years in bank, the fine grasses almost all gone, and the surface generally covered with a coarse vegetation scarcely eatable, composed of weeds, rushes, bogs, &c., the farmer then thinks it time to let down the marsh, and drown it. This method is performed by cutting away the bank opposite the ditches, and by removing the mud from off the sluices; thus, the water having a free course through all the ditches, circulates the sediment equally over all parts of the marsh. A period of from five to seven years is considered necessary to produce the desired effect. Within this time there will have formed on the surface of the marsh (on an average,) a stratum of virgin mud, of from eight to twelve inches in depth. Should the marsh be permitted to lie down for eighteen or twenty years, it will then have collected a new stratum of from twelve to twenty-eight inches in thickness. After that length of time, there cannot be perceived any additional accumulation of mud, because the flow of the common tides will be no higher than about on a level with the surface; and I think it would be a certain loss to any farmer to let his marsh continue in its wild state after it had been down for even ten years, for the accumulation of the mud would in no way compensate for the loss of the difference of time, in which profit might have been derived from it in the ordinary manner of mowing and grazing. The first time that wild marsh may have been reclaimed, has never been considered so valuable nor profitable, nor will it so readily receive or retain that system of improvement, as a meadow which had been

some years previously in bank, and turned down and drowned, and the second time reclaimed and cultivated.

I must here remark, that it is in a great measure owing to practical knowledge in agricultural science (in which some of my neighboring farmers have displayed their talents in the judicious management of their meadows,) that their veal has deservedly acquired the applause of the citizens of Philadelphia; and the markets of New York, as well as Philadelphia, will warrant me in saying, that the beef sent from Salem county has never been excelled by that supplied from any other part of the United States; and I have the vanity to believe, that even the best farmers in England have not exceeded us.

Internal Irrigation.

I can say but little of the salt marshes lying near the sea coast, and which had been periodically covered by the water of the ocean previously to their being reclaimed. There is an opinion generally prevalent, that a certain portion of salt is beneficial to grain and grass: may not too great a quantity of it be also prejudicial? I have often used the pickle from my meat tubs, and with complete success, in the destruction of the St. John's wort, and ranstead, or snap-dragon, where they have occasionally appeared on my land. And I am inclined to believe that all perfectly salt marshes, after having been in bank for several years, (and when the native vegetation of the soil has died,) become almost a barren waste, and when exposed to the penetrating rays of the sun, their saline particles are extracted for some inches in depth, so that distinct particles of almost pure salt may be seen on the surface. Indeed, I have seen the salt in such profusion when passing over the marsh, that my shoes would be as white as if walking in a thick hoar frost, and I cannot believe that any soil so highly impregnated with salt can be rendered profitable, for a series of years, in either grain or grass. As I know that some experiments are making to reclaim this highly saturated and almost useless kind of property, I will herewith submit my opinion as to the best mode of preparing this kind of real estate, whereby the owner may calculate on deriving more certain profit from it than is generally received.

So far as I have had opportunities of observing, I have generally seen springs of good fresh water issuing from the uplands and woods, and by the time they have united their numerous rills, they will have formed a creek of considerable size and depth, which, in meandering through the marsh, is discharged into the larger creek or river through the sluices or flood gates. Now nothing appears to me more rational to be done, than that the farmer should make a right application of this fresh water; which to one thus situated, I consider of the greatest importance. To freshen this reclaimed marsh, so as to make it just brackish enough to produce all the improved kind of grasses, he has nothing more to do than to shut down his inside doors to his sluices or flood gates, and hold the water until it shall have raised in height, so as to cover the surface of the whole marsh: his trunks lying in the bank (as before described,) will then vent all the superfluous water. Let this be done in the fall, and be continued until the following spring, then the water might be drawn off, and grain or grass sown, as suited the fancy of the owner. I have no doubt that in repeating this process for two seasons, the marsh will freshen exceedingly, and otherwise be materially improved. I would also suggest, that throughout the summer, the sluices or flood gates should be attended to, by having boards slid in them; and in the mouths of the ditches, pieces of plank should be set edgeways, so as to keep in all the ditches a certain and continued supply for the cattle, and different kinds of grain and grass which may have been committed to the soil. The height of the water in the ditches can easily be regulated by the number of planks to be put down, the one over the other. Another great advantage to be derived from this process would be, as I have before said, that the weight of water lying for several months on this peaty and light marsh, would tend to compress and render it much more susceptible of receiving the seed to advantage when sown on it.

Grain in Meadows.

I cannot say any thing in favor of the different kinds of grain, either from my own cultivation or that of my neighbors. I have known good crops of wheat, rye, corn and oats produced; but yet I have considered the cultivation of grain generally in meadows, as much too precarious for profitable culture. You may sometimes have a beautiful and strong standing crop of wheat or rye on the good blue mud along the bank, or edges of the creek or guts; but it would be no more than a mere slip, with here and there a patch, compared to the residue of the marsh; all the other parts will be nothing but weeds and rubbish. I also consider it a certain waste of time, labor and money, in endeavoring to derive a profit from sowing any kind of grain on the peaty or horse-dung soil; it may vegetate for a while, and produce a show of some straw, but very little, if any grain. I admit that grain has sometimes succeeded on the good blue mud soil, but when you take into consideration that all kinds of grain are uncertain in marsh grounds, and also the hosts of enemies of different tribes which will prey upon it, such as grub-worms, mice, and birds without number; and moreover the grasshoppers and cockroaches which attack the grain after it has been reaped, and while in shock, you may readily conclude that the risk of the destruction would be much more probable than a fair calculation for profit.

My judgment, therefore, is, (calculating for a series of years, say six or seven,) that the loss would by far overbalance the profit. In my agricultural pursuits in early life, I was led to believe that the marsh was the very quintessence of nutriment for all plants, and that all kinds of grain might be cultivated there in great perfection. I tried different kinds of grain, and succeeded in causing them to grow; but, I remember, not to my satisfaction. I have long been satisfied in my own mind, that the upland was by nature intended for the production both of grain and grass, but that the marshes were designed for grasses only. There can be nothing more true in agricultural science, (according to my estimation,) than that a plough should never enter a marsh soil; we may be assured that the best side of any marsh is uppermost.

I have herein endeavored to give you my practical observations and opinions in answer to a part of the twelfth inquiry, as stated in the 4th vol. p. 307, of the Memoirs of "The Philadelphia Society for promoting Agriculture." Should any thing I have written, be considered of utility in aiding the advancement of agricultural science, it is entirely at your service.

I am, with great respect, &c.

ROBERT G. JOHNSON.

RICHARD PETERS, ESQ.

EXPERIMENTS ON CORN.

To the Editor of the Farmers' Register.

King William Co., December 20, 1836.

I this year made an experiment with corn and cotton, planted together; the result of which, I will state, as I consider it as necessary to make known our failures, as to publish our successful experiments.

Two acres of land with a very scanty crop of clover on it, were well fallowed in the winter, after spreading a little manure on the parts where the clover was thinnest—and the last of April re-ploughed and thrown into six feet beds. These beds were crossed at intervals of three feet, and planted the 2nd day of May—each hill alternately in corn and cotton. The cotton seed and corn, were rolled in plaster and ashes, and a small handful of the mixture was put into each corn hill before covering. The corn came up well, and grew off beautifully, maintaining, all the season, a fine deep green color—was left two stalks in the hill, and cultivated in the usual way, and produced 7 barrels per acre. The seed corn used, was the Maryland twin, which from this my first trial, I should say was more productive than any other variety I have tried. The cotton came up badly, grew badly, and produced next to nothing—something like 100 lbs. seed per acre, as I did not weigh it.

Five rows four feet apart, after being planted in cotton two feet apart in the rows, were planted in twin corn between the cotton hills, and the corn left two stalks in the hill, and the cotton two stalks, with a view of ascertaining whether the twin would bear thicker planting than the common large corn. The land was good and well cultivated. The product was one barrel of sound corn, upon one-twelfth part of an acre, and no cotton, that being completely smothered by the luxuriant growth of corn, which satisfied me it would bear planting at least one-third thicker than the common kind. Whether the product from the two acres (14 barrels) was the result of planting twin corn, or whether from the small quantity of plaster and ashes put into each hill, I am unable to say; I only state the facts, and leave others to draw their own conclusions. But I certainly do not think the land would have produced more than five barrels per acre, without the cotton, cultivated in the usual way in the common corn. I now believe I should have made 10 barrels per acre, if I had had a corn hill in place of the cotton—that is, six by three feet.

I have this year tried upon a larger scale, the method of cultivating the corn crop, which one of your correspondents calls the "no hoe system," with which I am very much pleased, having cultivated, in corn, 160 acres with ten hands and four horses, without hoes and without ploughs. As soon as we finished replanting, we commenced thinning; for which purpose we used the hoe, with the view of cutting up a bush or bunch of briers we might meet with, and the hoes were never used afterwards except to chop around ditches or small places which could not be got at with the cultivators, which are started as soon as the corn is up, or even before all is up, and kept running alternately the wide and narrow way until we lay by, which is done with a skimmer. The corn of course is laid off straight both ways. I use a cultivator of the common X kind, except that the teeth are a little pointed instead of square, and the edges of them turned back, which renders the draft easier and makes them run deeper. This method of course can only be practised on land nearly or quite level. The field cultivated this year, I am convinced, has produced more than it did the two last years it was in corn, when ploughed in the usual way, and hoed three times, with a saving of at least one third of the labor. We cannot afford to make corn in the old fashioned way during the present great demand for labor of all kinds, even at the present high price of the article.

Any disposition you may make of the above will be perfectly satisfactory to

H.

P. S.—Upon the supposition that the egg of the Hessian fly is deposited upon the grain of wheat, I this last seeding time, sowed a small parcel of imported German wheat, one-half of which was oiled; but regret to find not one grain in fifty came up, either of that which was oiled, or the other half not greased. It is a well known fact to every good housewife, that their eggs, of all kinds, to hatch at all, must be carefully kept from grease or oil. May it not prove equally as efficacious, when applied to the Hessian fly egg, as when applied to the hen egg? H.

For the Farmer's Register.

COTTON SEED OIL.

1st. In Silliman's Journal of August 1824, is an article on cotton seed gas, by Professor Olmsted, then of the University of North Carolina, now of Yale College, who found by experiment that 1 lb. cotton seed would afford about 9½ cubic feet of gas, and hence made the following calculations.

	lbs.
Cotton made in United States, 1824,	100,000,000.
Cotton seed, more than	300,000,000.
	Cubic feet.
Capable of producing, gas,	2,827,500,000,
Quantity of gas required annually to light the city of London.	400,000,000
To make which are required,	
Chaldrons of coal,	33,000.

Illuminating power of gas, double that of coal, therefore the whole cotton crop of 1824 was capable of supplying 14 such cities as London with illuminating gas.

In other words, the gas made from the seed of the whole crop of 1824 would have been equal to that made from 462,000 chaldrons of coal. Suppose, however, that only one half of the seed

made is converted into gas, then there would be a supply for seven such cities as London, equal to 231,000 chaldrons of coal. But the estimated crop of cotton for 1836, is Bales. 1,500,000,

Or	lbs. 675,000,000.
Seed of which is	2,025,000,000.
Half of which is	1,012,500,000.
	Cubic feet.
Which would afford gas	9,618,750,000.

More than enough to supply 24 such cities as London, and equal to, Chaldrons of coal. 792,000.

The flame of cotton seed gas is distinguished for its purity and softness.

2dly. In the Farmers' Register, vol iii. p. 295, is a summary of the cotton seed oil manufactured down to that date.

The cotton seed huller was invented, as is well known, by Mr. Francis Follet, of Petersburg, about seven years ago. Several other hullers have been made since, but whether on a new principle, or not, seems not to be generally known.

The patent right of Follet's huller was purchased by a Mr. Plumer of Mississippi, for nearly all the principal cotton growing countries in the union, who has refused, it is said, high prices for sub-patents, and thus the cotton seed oil manufacture has been subjected to all the evils of a monopoly, capital and enterprise being excluded.

In the mean time Mr. Baxter, a resident of Petersburg, has procured a patent for a new hydrostatic press, with a pressure of 400 tons. This invention, I doubt not, will form an era in the oil manufacture; and it is remarkable how little it is as yet known. The press is however of no use without the huller, and that, it is seen, is restricted by a monopolizing patent, in almost the entire south-west. Fortunately this patent will expire in seven years. Whether the hydrostatic press is destined to come into the hands of a monopolizing purchaser or not, remains to be seen.

3dly. The value of the surplus cotton seed of the United States, converted into oil, cannot be less than ten millions of dollars—a respectable item in the wealth of the country.

The cotton seed oil is used to burn in lamps in Petersburg, and is said to burn beautifully. It is highly spoken of as a paint oil. A number of houses in Raleigh, North Carolina, are painted with it. It is said to be a fine salad oil, and as a friction oil stands pre-eminent. The oil cake is a capital food for stock, and will itself pay all the expenses of the manufacture.

Baxter's press will make 40 gallons of oil per diem, with a hired labor of three dollars a day. The oil is worth $1 25 per gallon, which will be $50 a day, or $15,600 per annum.

Such are a few hints I have picked up on this matter, and hastily set down. Unfortunately for the public, practical men, who are most competent to give information on such subjects, are the least apt of all others ever to put pen to paper.

C. C.

Jan. 20, 1837.

From Loudon's Gardener's Magazine.

ARTESIAN WELLS.

M. Mulot, who has the management of the process now in operation at the Barriére de Grenelle, near Paris, for forming artesian wells, has already penetrated 1088 feet without finding water. His contract is to bore as low as 1200 feet; and if no water is found at this depth, the engineer is ready to make a new contract with the city of Paris, to go to the enormous depth of 2000 feet; such a depth has never yet been sounded on the surface of the globe. (*Athenæum*, 1836, p. 740.) If the depth of 2000 feet can be attained, at any thing like a moderate expense, it is probable that a still greater depth is practicable; and if so, water may probably be found in every spot on the face of the earth. The fertility of the most arid deserts would thus be secured, and the whole world rendered one fertile garden. The next step would be to call down fire from the clouds, in the form of electricity. so as to facilitate the operations of cooking, and the driving of machinery.

From Loudon's Gardener's Magazine.

ACCELERATING THE GROWTH OF SEEDS BY SCALDING.

Cobbett, in treating of the locust, says, that he was recommended by an American gentleman (Judge Mitchell of Long Island) to boil the seeds previously to sowing them. (See *Arb. Brit.*, p. 624.) And the idea is not so ridiculous as might at first sight be imagined. The subject was noticed by Professor Henslow, at the meeting of the British Association at Bristol; and the following is an extract from a communication by the professor to the *Magazine of Natural History*, vol. ix. p. 477:—

"Sir John Herschel lately sent some seeds of an acacia from the Cape of Good Hope, to Captain Smith of Bedford, with directions that they should be scalded, in order to secure their germination. Captain Smith having presented me with a dozen of these, I subjected them to the following experiments:—Two were placed in boiling water, and left to soak for an hour, until the water had become cool; two were kept at the boiling temperature for 1½ minutes; two for 3 minutes; two for 6 minutes; and one for 15 minutes. Some of these were sown immediately, under a hand-glass, in the open border; and the rest were kept for 3 or 4 days, and then sown in a hot-bed. The following are the results obtained:—

Under the hand-glass,—

1, boiled for	1½	minutes,	failed.
1 -	3	minutes,	came up in 14 days.
1 -	6	- - -	13 days.
1, not steeped at all, did not germinate.			

In the hot-bed,—

1, boiled for	1½	minutes,	came up in 8 days.
1 -	3	minutes - -	7 days.
1 -	6	- - -	7 days.
1 -	15	- - -	13 days.
2, in boiling water, left to cool			- 9 days.
2, not steeped		- -	- 21 days.

We cannot draw any decided inference from the single seed, which was boiled for 15 minutes, having been more retarded than the rest, as it might have been a bad specimen; but it seems very clear, that the heat to which these seeds were exposed must have acted as a decided stimulus to their germination; whilst it is a very singular fact,

that they should not have been completely destroyed by it. Had I supposed it probable that a seed, which was boiled for 15 minutes, would have germinated, I should have boiled some of the others still longer, in order to ascertain the extreme limit to which such severe treatment might be carried without destroying the vital principle."

In pursuance of this subject, at the Bristol meeting, "Mr. Hope mentioned a practice, common in some parts of Spain, of baking corn to a certain extent, by exposing it to a temperature of 150°, or upwards, for the purpose of destroying an insect by which it was liable to be attacked. Dr. Richardson mentioned, that the seeds sold in China for the European market, were previously boiled, for the purpose of destroying their vitality, as the jealousy of that people made them anxious to prevent their exportation in a state fitted for germination. Upon sowing these seeds, he had, nevertheless, observed some few of them were still capable of vegetating." (*Edin. New Phil. Journ.*, vol. xxi. Oct. 1836, p. 333.

From Loudon's Gardener's Magazine.

HEATING BY HOT WATER DRAWN UP FROM THE BOWELS OF THE EARTH.

It seems to be now proved beyond dispute, that the temperature of the earth increases from the surface downwards; and consequently, at a certain depth, the heat of water must be at the boiling point; and at a still greater depth, all materials whatever must be in a fluid state. At the meeting of the Bristol Association in August, 1836, Professor Stevelly suggested the idea of bringing up hot water from the bowels of the earth to the surface; and heating houses, manufactories, &c., with it, so as to keep them at a given temperature, in the same manner as is done with the apparatus by water artificially heated. (*Lit. Gaz.*, Sept. 3, 1836, p. 551.) As, at a certain depth, the water must be at such a degree of temperature, as when allowed to expand, it will instantly become high-pressure steam, it seems not altogether impossible that our stationary steam engines may be supplied with that material without the use of fuel; and hence those who look forward with fear to the period when the coal mines will be exhausted, may derive some small degree of consolation. At all events, it seems not unreasonable to suppose that, if a bore or artesian well is carried so deep as to penetrate into a stratum of water at a sufficient temperature to expand itself into steam, there will be no difficulty in the water ascending to the surface. If ever so complete a command of water should be obtained by man, in every part of the world, except, of course, the frozen zone, the climate and culture of the whole would be altered: and who can tell what may be the ultimate result of the operations of man, in one way or another, chemically, electrically, and mechanically, upon the globe?

From Loudon's Gardener's Magazine.

BEET CULTURE.

M. Soulange-Bodin was some time ago appointed Vice-Secretary to *La Société Royale et Centrale d' Agriculture:* and, on the 10th of April last, I had the pleasure of hearing him read a very elegant discourse, which was highly applauded by the members present, and has since been published in a cheap monthly agricultural journal, called *L'Agronome.* In taking a general review of the present state of agriculture in France, M. Soulange-Bodin notices the great increase of the culture of the potato; and he considers the beet as a source of incalculable riches, not only for France, but for Europe in general. Of course, the value of the beet depends mainly on the sugar which can be procured from it, but not altogether; for the beet is much better adapted, as a green crop, for feeding cattle in a warm climate, than either the turnip or the potato. The culture of the silkworm, and that of the Saxon merinos, occupy a good deal, also, of public attention; and, lastly, the culture of the forests. MM. Vilmorin, Michaux, Jaume St. Hilaire, Mirbel and Loiseleur Deslongchamps, are represented as continually urging the great importance of introducing all kinds of foreign trees among the indigenous ones in the native forests. Great attention, it appears, is being paid to the study of the insects which attack trees; and Michaux is stated to have made some valuable discoveries on the subject: but I refer you to *L'Agronome.*

From Loudon's Gardener's Magazine.

VITALITY OF SEEDS.

It will be in the recollection of our readers, that, in October 1834, we published some interesting details of the opening of a British tumulus, near Maiden Castle, by Mr. Maclean, who found therein a human skeleton, and a portion of the contents of the stomach, containing a mass of small seeds, which neither the operation of the gastric juices, nor the lapse of probably twenty centuries, had sufficed to destroy. Many of these seeds have been subjected to various careful experiments, to ascertain whether the vital principle was extinct; and we have the satisfaction of announcing that Professor Lindley has happily succeeded in producing plants from several of these seeds. These plants have confirmed the opinion expressed by the learned professor, on a first inspection of the seeds, that they were those of the rùbus idæus, the common raspberry. The plants are now very vigorous, have produced much fine fruit this season, and form an object of the greatest curiosity and attraction to horticulturists. This highly interesting circumstance proves the raspberry to be an indigenous plant in this country, growing at a very early period, and then constituting an article of food. (*Dorset Chronicle*, as quoted in the *Bath Journal* of Sept. 12, 1836.) We have seen the raspberry plant alluded to in the Horticultural Society's garden. The facts are extremely interesting; and we hope Dr. Lindley will compare this case with others of the kind upon record, and favor the world with a memoir on the subject.

From Loudon's Gardener's Magazine.

THE STEAM-PLOUGH AND THE SCOTCH SYSTEM OF HUSBANDRY.

At the fifth anniversary of the East Suffolk Agricultural Association, held at Wickham Market, Sept. 8., the most interesting remarks of the evening were the opinions advanced by the presi-

dent, by Lord Henniker, and by Mr. Shawe, in favor of the new poor law, the steam-plough, and the Scotch system of husbandry. Lord Stradbroke enforced the necessity of improving the implements of agriculture; and pointed to the manufacturing districts for proof that the improvement of machinery brought an increase of wealth to the capitalist, and of comfort to the workman. The agriculturists must keep pace with the spirit of the age in doing their utmost to lessen the cost of cultivation. The steam-plough, of which his former mention had been received with incredulity, had actually been completed, and, with a little alteration, was likely to be brought into general use. He was convinced that means like these were the best that could be devised for the relief of the agriculturists, and by which they might hope to become once more an exporting, instead of an importing, nation. Lord Henniker said he hoped that a day of greater prosperity than they had yet seen was dawning on the farmer, and that his difficulties were nearly at an end. In corroboration of the president's statement as to the steam-plough, he had received a letter from a friend in Lincolnshire, who informed him that in his neighborhood they had got one already, and that it wuuld plough eight acres and harrow thirty in a day. Mr. Shawe thought that some time must elapse before the steam-plough would be brought into general use; and in the mean time, as it appeared by the evidence before the Agricultural Committee that the Scotch system of husbandry was much less costly than ours, he suggested that a deputation should be sent into Scotland to inquire whether any more economical method could be introduced here. (*Bury and Norwich Post*, Sept. 14.) We hope such a committee will be appointed: the farmers of England, not even the most intelligent of them, including what are called the gentlemen farmers, have not the least idea of what farming is in the best cultivated districts of Scotland—for example, in East Lothian. The effects of the subsoil-plough, of Mr. Smith of Deanston, and of the reaping machine of this gentleman, and of the Rev. Mr. Bell, whose machine has been introduced into the United States of America, will astonish them.

RABBITS PREFERABLE TO PIGS FOR MAKING MANURE.

I have these four years past kept several rabbits, in order to ascertain if they would not be more beneficial for a cottager to keep than pigs; but I always lose a great many of the young ones when they are about two months old; and I find it is a general complaint amongst all persons that keep them. If the young could be reared, I am satisfied that rabbits would be far more profitable than pigs, besides making a great quantity of valuable manure, and that out of the refuse of the garden, a great part of which pigs will not eat. I use no other manure than rabbits' dung, and the water which I collect in a cesspool from the drain of the house; and my garden produces good crops of all sorts of vegetables. I should be glad to know if any of your readers have tried rabbits in the same manner as I have done, and what has been the result.—*J. F. Drury, Churchlands, Cheshunt, Nov.* 19, 1836.—*Loudon's Gard. Mag.*

From Loudon's Gardener's Magazine.

SALUBRITY AND INSALUBRITY OF SITUATIONS.

We are persuaded that very few persons are aware of the superior degree of healthfulness of an elevated open situation, exposed to the south rather than the north, and on a dry and, if possible, calcareous soil. Few of us are aware, also, of the superior dryness produced in the floor and the walls of ordinary houses, by raising the lowest living-floor 3 feet, or 4 feet, above the surrounding surface. In laborers' cottages this is of the very last importance, as we shall show on a future occasion. We shall, in the mean time, extract some notices on the subject from Dr. M'Culloch, and from what we consider the most useful review of his book that has yet appeared, in the *American Quarterly Review*, No. viii., for December, 1828. "Malaria (bad air,) miasma (*miainŏ*, to infect,) or marsh exhalation, is something which originates in swampy, marshy, moist ground, wherein vegetables having grown, die, and putrefy. Vegetables that die and become disorganized in cold weather do not appear to produce this infectious malaria; nor do vegetables that die, and are dried up by heat in a dry place. Nor do we find it in places bare of vegetation, unless vegetable matter, liable to putrefy, be found there accidentally, or brought there purposely. Nor do we find this miasmatous air prevalent in the winter season: the months of July, August, and September, including in warm climates, one half of October, are the seasons when this pestilence chiefly prevails. But it has been observed, that places producing remittent fevers in the fall are liable to produre intermittents in springs. Places completely covered with water do not produce malaria, although the margins of such places do. This poison is now ususually supposed to be a gas, acting by its chemical properties; by others, it is presumed to be an exhalation, effluvium, or odor; the ancient opinion, at present not considered as worth investigation, is, that the deleterious quality of the air impregnated with it, is owing to animalcula. Malaria, according to Dr. M'Culloch, is the source of more than half the diseases to which the human race is subject, and of more than half the mortality which depopulates mankind. It seems to be the angel of destruction, ordained to maintain the necessary proportion between population and the means of subsistence. It detracts one half from the value of life in Holland; and at least as much, and probably more, in Italy. The chances of life in England are variously calculated from forty to fifty years. In many parts of Holland they are not more than about twenty-five. In many places of France they are reduced by malaria to twenty and eighteen years. Sicily and Sardinia, and much of Greece, are similarly affected. Lincolnshire, Essex, Cambridgeshire, and the North Riding of Yorkshire are known seats of this pestilence in England. Oliver Cromwell died of it; and, although we are become much better acquainted with its effects and its habits than formerly, great ignorance still prevails, even in England, on this interesting subject. People are not yet aware of the many situations pregnant with latent disease, where danger is not suspected; nor are they aware of the anomalous forms of indistinct, but

painful suffering, attributable to this cause where the absence of intermittent or remittent diseases induces a dangerous confidence and security. Dr. M'Culloch is inclined to ascribe to this cause the following list of disorders: Yellow, remittent, intermittent, and nervous fever; dysentery, diarrhœa, cholera, visceral obstructions; dropsy, œdema, obstructions of the liver and spleen, neuralgia, and, in particular, that form of it, the tic douloureux, to which we would be strongly inclined to add the dengue of the Havanna and Charleston, scrofula, and goitre; hebetude of intellect, and general lastitude; a Bœotian diathesis; rickets, hernia, rheumatism, sciatica, toothache, asthma, peripneumony, dyspepsia, palsy, phthisis, chlorosis, are doubtful; not that these disorders, or any of them, do not, in many cases, originate in other causes; but that they are, in many cases, fairly ascribable to the effects of malaria or miasma.

EFFECTS OF LEGISLATIVE AID TO AGRICULTURE IN THE STATE OF NEW YORK.

No. II.

To the Editor of the Farmers' Register.

Dear Sir,—In my former communication in answer to your inquiry of "what has been done by the legislature of New York in aid of agriculture?" I brought down the subject to the year 1830. I will now proceed to discharge the remaining duty imposed upon me. I must be permitted, however, to go back and observe, that the several county societies that organized under the law of 1819, not receiving any farther aid from the treasury of the state after 1825, they, one after another, became extinct, with the exception of the society in the county of Jefferson, where by the munificence, example, and through the influence of Mr. Le Ray de Chaumont, it was not only continued, but gave, in each succeeding year, new indications of great usefulness. This became so evident, not only to residents in that county, but likewise to gentlemen who occasionally travelled through it, that the friends of agriculture began once more to bestir themselves, and proposed the organization of another state agricultural society and the formation of county societies under it. For that purpose, several gentlemen residing in different portions of the state, met in Albany, in February 1832, to devise a plan of operations that would best fulfil their intentions. The meeting was as large as could be expected. A society was formed, and committees appointed to digest and report to a subsequent meeting such plan as would give most efficiency to our views, and likewise to obtain an act of incorporation from the legislature of the state. An act for that purpose was passed, April 26th, 1832. It gave us the power to organize, but no special privileges. We formed our society under the act, and have held our annual meetings in Albany, each succeeding February. I have punctually attended them, and been amply compensated for it. I would not forego the pleasure for a trifling consideration; for, even if the sphere of my usefulness is not increased, a glow of feeling is imparted, which cheers and animates, and makes me more a friend to the pursuit. Several counties once more formed societies, but they did not generally enter the field with that spirit which insures success. Their members again had recourse to premiums to make the exhibitions interesting, but as state patronage was withheld, the funds for that purpose were raised among the members. A sufficiency in this way could not be obtained; it was an up-hill business, and the last autumn has witnessed the expiration of many of these county societies. From former experience, their long duration, under existing circumstances, was not anticipated; their decease, therefore, has not been a cause of much disappointment. We early saw, however, after the organization of the state society, that a paper was wanted, to circulate not only our proceedings, but likewise to impart agricultural intelligence to our farmers. A plan was at once adopted to commence such an establishment, and the Cultivator was issued under the auspices, but not at the expense of the society. That paper has been well sustained by the community—with what benefit, it is for our farming population to determine. Another object we had in view, was the organization of an agricultural school, under legislative sanction. The act (a copy of which I send you,) not having been obtained until May 1836, has not yet been carried into operation. Its friends, however, will not let the subject rest; but, I think, will test it fully. You will observe, it is an act incorporating the subscribers, but without appropriating funds for the purposes recited in it. They, the subscribers, contribute the whole of the fund, and receive the emolument—but, in any event, they are not to divide over 5 per cent. interest on their stock. Upon this plan, they have the entire control of the institution, and they would wish to act, if possible, independent of state bounty. In this way, the enterprise is made their own—they feel more responsible for its acts, and, of course, will take a deeper interest in its success. I cannot permit myself to doubt its practicability, and if we are not disappointed in its results, it will not only do great good in this state, but wherever it shall send its graduates. To develope, however, more fully, what we conceive will be its probable practical effects upon the future increase of our agricultural products, I must acquaint you with what is intended to be taught in this institution. First, *mathematics*—the science which contemplates whatever is capable of being numbered and measured, so far as it leads to a correct knowledge of practical mechanics, the application of the principles of power, and land mensuration. Second, *chemistry*—the science which enables us to discover the peculiar properties of all natural bodies, either in their simple or compound state, so that we can analyze the different kinds of soils, ascertain wherein they differ, and, if possible, in what the principles of fertility consists, and what must be added, or taken away, to make barren or unpropitious land more productive. The doctrine of manures cannot be understood without a knowledge of chemistry; and it is a subject so extensive in its application to farming purposes, that it must become the A B C of the farmer's education. *Geology*, and if necessary, *mineralogy*, so as to discriminate between the different kinds of substances the earth is composed of, that we may have a correct knowledge, not only of what the surface of the soil consists, but what is buried beneath it. *Botany*—the science of plants, or that

part of natural history that relates to vegetables, that we may ascertain their different uses, discriminate the exhausting plants from those which are not so much so—the locations most favorable to their growth—the seasons for their production and reproduction—their laws of generation—the alternation that ought to be observed for the best development of their powers, so that whatever plant we cultivate, it will be the most perfect and valuable of its kind. *Entomology*, or more properly, *grubology*—to ascertain the kind, nature and variety of insects that prey upon, destroy or injure our corn, wheat, turnips, fruit, &c. with a view to their protection and destruction. The principles of industry are to be instilled, and the most regular and systematic manner of farming practised. A correct moral deportment inculcated both by example and precept—early rising and cleanliness promoted—in short, the practice of every virtue insisted upon and most sedulously maintained, whilst idleness and vice must receive no countenance. So, that when young men graduate from this institution, their minds shall be well stored with all the information that relates to the peculiar business of farming—their hands taught to give efficiency to the knowledge they have acquired, and their habits formed to give stability to their characters, and make them most useful members of society. In enumerating the studies to be pursued, I may not have been sufficiently select or particular—my object is to give only a general outline of the plan, which, when hereafter put in practice, will be more carefully and systematically arranged.

Suppose such an institution to contain two hundred students, and a course of studies to last three years. It would send each year near seventy young men, so educated, into the different sections of our state. Their knowledge of theoretical and practical farming would be generally diffused; and continue this number for many successive years, it would give thousands of the best farmers, scattering them through every portion of the state. And here let me ask, who is so much of a skeptic as not to believe that agricultural knowledge would not be increased by so great an accession, and in consequence, agricultural products be prodigiously multiplied? But, this is not all; our school would not only send her missionaries of intelligence and industry through this state, but all her operations, so far as competent professors could discharge their duty of instructing or experimenting—of collecting, comparing and examining—of all that was most familiar or rare—ornamental, useful or profitable, in each of their peculiar departments—in a short time we would have a farm and collection, which would vie in extent and appearance, and much exceed in usefulness, the far-famed gardens of London or Paris. Probably, at no time, in the history of our state, could an agricultural school be founded under better auspices for ultimate success, than at present. By the establishment of agricultural journals, a taste for that kind of reading has been created; our citizens are alive to farther improvements, for they have heretofore felt the want of any. The efforts made and making to give a more thorough school education to our population—the ability of our citizens to contribute whatever may be required to carry the object into effect—the easy transmission of produce through every portion of our state by our rivers, roads, canals and railways—the facility of communication with New York, one of the best markets in the world, all are so many aids to the successful completion of the plan. Should this school go into operation, and carry out the great principles of its founders, the time will, *must* come, when every citizen will be proud of it as a state institution; when those who have been its friends, will gladly come forward and claim the honors to which they will be entitled, and the present state authorities will take a pride to date its commencement as coeval with their administration of power; for, besides being a test farm systematically managed, its manufacture and collection of the various farm implements, its specimens of geology, mineralogy and botany, the exhibition of its animals, the order and regularity of all its operations in husbandry, the circulation among our farmers of useful intelligence collected there, either from practice or experiment, the aids it will give to our agricultural journals, and above all, the young men it will yearly send out to every portion of our country to vivify by their intelligence, and fructify by their industry, whatever place they settle in, will be so many claims to popular favor, for they will be constant and living evidences of its great usefulness.

I remain your friend, &c.

J. P. BEEKMAN.

Kinderhook, Jan. 26, 1837.

P. S.—We have called a meeting of the commissioners for the 14th of February, to organize, if the subscription warrants, and take the preliminary steps towards the formation of the agricultural school.

AN ACT TO INCORPORATE THE NEW YORK STATE AGRICULTURAL SCHOOL.

[Passed, May 6, 1836.]

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

1. William L. Marcy, John Tracy, Jesse Buel, Stephen Van Rensselaer, Henry Yates, Gideon Lee, Joab Center, John P. Beekman, Cornelius W. Lawrence, Philip Hone, Benjamin Knower, Gouverneur Ogden, Erastus Corning, James Wadsworth, David E. Evans, Hiram Pratt, Walter Cunningham, Gilbert O. Fowler, Nathaniel P. Tallmadge, Nicholas Devereux, Anthony Van Bergen, Garrit Wendell, Archibald M'Intyre, Thomas D. Burrall, John Greig, Thomas W. Olcott, Ziba A. Leland, George P. Oakley, John Delafield, Edward P. Livingston, John Townsend, Lewis F. Allen, and all such persons as now are, or may hereafter become associated with them, are hereby constituted a body corporate, by the name of "The New York State Agricultural School," for the purposes of instruction in literature and science, and improvement in scientific and practical agriculture and the mechanic arts.

2. The capital stock of the said corporation, shall be one hundred thousand dollars, with liberty to increase it to two hundred thousand dollars, to be divided into shares of twenty-five dollars each, which shall be considered as personal property, and be assignable in such manner as the said corporation may, in its by-laws, from time to time, provide: which said capital stock shall be exclusively devoted to the purposes and objects of the

said corporation, as declared in the first section of this act, and to no other purposes or objects whatever. And to the same end, the said corporation shall have power to take, hold, and convey real estate to the extent of its said capital.

3. Jesse Buel, Lewis F. Allen, Henry Yates, John P. Beekman, Joab Center, Walter Cunningham and John Delafield, shall be commissioners to receive subscriptions for, and to distribute the said capital stock of the said corporation.

4. The said commissioners, or a majority of them, shall, within thirty days after the passage of this act, open a subscription book for the said stock, at such times and places as they shall appoint; and they shall give at least fourteen days' previous notice thereof, in at least two of the agricultural papers in this state.

5. At the first subscription to the capital stock of the said corporation, no subscription above one thousand dollars, by, or in behalf of the same individual, shall be received. Five per cent on each share subscribed for, shall be paid to the said commissioners at the time of making such subscription; forty-five per cent thereon, when afterwards called for by them; and the remaining fifty per cent, at the expiration of six months from the time of such subscription.

6. If the whole of the capital stock of the said corporation, be not taken up at the first subscription thereto, the said commissioners, or a majority of them, may receive further subscriptions thereto, from time to time, until the whole capital stock of the said corporation shall be taken up.

7. The said commissioners, or a majority of them, shall, within twelve months after the passage of this act, proceed to distribute the capital stock of the said corporation among the subscribers thereto; and in case there should be subscriptions to more than the amount of such stock, it shall be the duty of such commissioners to apportion the same among the subscribers thereto, in such manner as they may deem most advantageous to the interests of the said institution, and best calculated to promote its objects.

8. The stock, property and concerns of the said corporation shall be managed by thirty-two trustees, of whom the governor and lieutenant-governor of the state, for the time being, shall always, by virtue of their offices, be two; and the remaining thirty shall be stockholders of the said corporation, and citizens of this state. They shall be elected annually, and any seven thereof shall be a quorum for the transaction of the ordinary business of the said corporation.

9. The persons named in the first section of this act, shall be the first trustees of the said corporation, and shall hold their offices until the first Tuesday of February, one thousand eight hundred and thirty-seven, and until others shall be elected in their places.

10. The trustees of the said corporation for every subsequent year, except the governor and lieutenant-governor, shall be elected on the first Tuesday of February in each and every year, at such hour of the day, and at such place as the trustees for the time being shall appoint, and of which they shall give public notice, not less than fourteen days previous to the time of holding such election, by advertisement to be inserted, in at least two of the agricultural papers in this state.

11. At every election of trustees, each stockholder shall be entitled to one vote on each share of stock owned by him, and which he shall have held for at least fourteen days next preceding such election.

12. All elections for trustees, other than the governor and lieutenant-governor, shall be held under the inspection of three stockholders, not being trustees, to be appointed previous to every election by the board of trustees for the time being. Such election shall be by ballot, and by plurality of the votes of the stockholders or their proxies then present; and the thirty persons who shall receive the greatest number of votes, shall, together with the governor and lieutenant-governor for the time being, be the trustees of the said corporation: and if at any such elections for trustees, two or more persons shall have an equal number of votes, then the trustees who shall have been duly elected, shall proceed by ballot, and by plurality of votes to determine which of the said persons, so having an equal number of votes, shall be trustee or trustees, so as to complete the whole number.

13. If any trustee of the said corporation, other than the governor or lieutenant-governor, shall cease to be a stockholder thereof, or shall remove out of the state, his office shall thereby become vacant; and whenever any vacancy shall happen among the trustees, such vacancy shall be filled for the remainder of the year in which it shall so happen, by such person possessing the qualifications above required for trustee of this corporation, as the remaining trustees for the time being, or a majority of them, shall appoint.

14. The trustees of said corporation, as soon as may be after their appointment or election under this act, shall, in like manner, proceed to elect, of their number, a president, two vice-presidents, a treasurer, recording secretary and corresponding secretary, who shall respectively hold their offices for one year, and until others are elected in their places. They shall also appoint such professors, teachers, agents, and other persons as may be necessary to conduct the proper business, and accomplish the declared objects of the said corporation.

15. The said trustees shall, as soon as may be, proceed to purchase a farm of about five hundred acres of land, either contiguous to, or near the Hudson river, and as nigh to the city of Albany as may be convenient; and shall cause to be erected thereon, such buildings as may be suitable and necessary, and make all such other arrangements as may be proper for the future business of the said corporation, and for the accomplishment of its objects.

16. The said corporation, in exercising its power of making by-laws for its own government, shall make it an indispensable requirement, that the professors, teachers, and pupils of the school hereby intended to be authorized and established, shall, unless prevented by sickness or other reasonable cause, occupy themselves for at least one half of the time the said school is in session, between the months of March and December, either in the practical agricultural business of the farm, or in the laboratories or mechanic shops connected with said school.

17. The said corporation shall in no case, out of the profits arising from its business, declare and make a dividend of more than five per cent per annum, upon its actual incorporated capital paid

in and possessed; and if at any time after the payment of such dividend, there shall remain any surplus of such profits, it shall be expended in additions or improvements to the farm, buildings, library, apparatus, or other necessary establishments connected with the said institution, or in reducing the price of tuition at the same.

18. The governor shall appoint annually a committee of three persons, whose duty it shall be to visit the said institution, and to report the condition thereof to the legislature at the commencement of its next session. The members of the said committee shall receive no compensation for their services under this act, but their reasonable expenses shall be paid by the said corporation.

19. The corporation hereby created, shall be subject to the provisions of the eighteenth chapter of the first part of the Revised Statutes, so far as the same are applicable, and have not been modified or repealed.

20. This act shall take effect immediately after the passage thereof.

New York State Agricultural School.

Books of subscription to the stock of the New York State Agricultural School, will be opened at Albany, New York, Poughkeepsie, Hudson and Buffalo, on the first day of June next, at such places as the commissioners may designate. Shares $25—five per cent to be paid on subscribing.

JESSE BUEL, *Albany.*
L. F. ALLEN, *Buffalo.*
HENRY YATES, *New York.*
JOHN P. BEEKMAN, *Kinderhook.*
JOAB CENTER, *Hudson.*
WALTER CUNNINGHAM, *Poughkeepsie.*
JOHN DELAFIELD, *New York.*

REMARKS ON DR. BEEKMAN'S LETTERS, ON THE LEGISLATIVE AID GIVEN TO AGRICULTURE IN NEW YORK.

No person who has read with attention the letters of Dr. Beekman, in this and the preceding No. of the Register, can fail to estimate very highly the benefits conferred on agriculture by the aid of government in New York; and there is no Virginian, who now deplores the waning agricultural prosperity of his own state, and has studied the causes of this decline, who would not earnestly wish to see this example of the State of New York followed, and improved, upon in the Old Dominion. In the noble career of devising and effecting public works, and economical improvements—in constructing canals, and other works of great expense and great value—in aiding private efforts for education by the judicious and discriminating application of public money—and in diffusing the knowledge of agricultural science and practical improvements—New York has truly done much for her own profit and prosperity, and much to induce other states to pursue a like course. Would that our imitation of the policy and action of New York, would both begin and end with these objects!

We mean not to express at length the grounds for either approbation or censure of any of the several parts of the New York system for promoting agricultural improvement, as described by Dr. Beekman. Were we to do so, much space would necessarily be occupied by our remarks—and we should merely be presenting, in another form, opinions which we have urged in various parts of the volumes of the Farmers' Register.

While readily and fully according to the county agricultural societies the merit of having had the most important agency in rousing and stimulating zeal for improvement, yet their organization, and the general plan of premiums adopted, were very defective—and but for these defects, it would not have been so easy for low demagogues to produce the dissolution of the system, by exciting popular envy and discontent.

Another important measure, the collection and diffusion, by publication, of the existing agricultural knowledge of the practical farmers of the state, commands our most decided applause, unmixed with objections of any kind. It was the cheapest as well as the most effectual mode of diffusing agricultural knowledge, and of the most valuable kind—and it is only to be regretted, that the plan of publication was not far more extensive, and far more enduring. The more recent establishment of the low priced and excellent little periodical, the Cultivator, is a similar work, though effected in a different mode. Some objections to the plan of this publication we freely stated, when it first appeared—and the changes afterwards made in its plan, showed that our views were not altogether unfounded. The state, indeed, did not directly aid the establishment, and support, and pay for the (at first) almost gratuitous circulation of this paper: but it amounted nearly to the same thing, when the State Agricultural Society lent all its influence to extend the circulation, and when such men as Judge Buel and Dr. Beekman were induced by public spirit alone, to furnish the editorial talents and labors required for the successful establishment of such a work, without remuneration. To procure a very extensive and permanent circulation for an agricultural periodical, is almost all that is required to insure its cheapness as well as its usefulness—supposing always, that it is conducted with proper industry and ability. It has been recently stated that the issue of the Cultivator amounts to 22,000 copies a year. If the Farmers' Register was taken by as many subscribers, it might be furnished at less than half its present price, and (notwithstanding the high prices of printing in Virginia, compared to the northern cities,) would then give far more profit to the publisher, as well as very far more value to the agricultural public.

The agricultural school established by law in New York, is likewise a work admirable for its design and its tendencies. But we fear that the plan carries within it the seeds of its speedy death, in the withholding of the fostering bounty of the state, and the still more niggardly limit of the possible *profits* to the adventurers or stockholders, to *five per cent.* per annum! It can scarcely be expected, that those who have thus vested their money, will derive any gain, except the applause of their countrymen, and their own gratification for

rendering service to their country's best interests. But if it were possible that the pecuniary profit could amount even to fifty per cent, or that such returns could be expected by the most sanguine, it would be very short-sighted policy to destroy all ground for such hopes, and thus remove the only never-failing motive to serve the public, which is presented in *self-interest*. But such an institution, however profitable to agriculture, and to the community in general, is not to be expected even to support itself, much less to yield a pecuniary profit on the investment—and the state, that will receive so much benefit therefrom, ought, both in justice, and in good policy, to pay all that may be wanting for the expense. Every youth thus educated, and who would devote his life to the labors for which he had been so admirably trained and prepared by the studies and labors of the school, would be of more value to his country than ten times the whole cost of his education at the agricultural school; and the state would make a capital bargain to defray only half the expense of thus educating annually any number of boys, who would, by their labor or their money, pay the other half of the necessary expense of such an education. This would be in accordance with the excellent plan of New York of sustaining common schools and agricultural societies—which is by aiding individual efforts, in proportion to the amount of money contributed by individuals—and not by grants entirely gratuitous, as annually and lavishly made to to the altogether worthless primary (or pauper) school system in Virginia.

From the Genesee Farmer.

FATTENING ANIMALS.

The high prices of grain the present season, has brought the question home to the business and bosoms of farmers, whether merchantable grain of any kind can profitably be used in fattening beef or pork for sale. We think that it cannot; and we have no doubt the verdict of practical farmers will in general be with us, even when the high prices of meat are taken into consideration.

The confessions of some of the most celebrated dealers in cattle in England, admit that where cattle are purchased for fattening, and fed in the most accurate and scientific manner from the best materials, that there is oftener a loss than a gain by the process; and that most of the compensation consists in the pleasure of seeing a number of beautiful and fat stall-fed cattle. Where the process of fattening in this country is carried on in the same way, with merchantable grain, the result has in general been found very similar. Where the feeding has commenced on grass, been carried on with roots, and finished with these, or with meal, a handsome profit is frequently realized by the feeder.

So with pork. The farmer who commences with sound corn, and finishes with the same, as he must if he begins with it—will have most likely good pork, but of a price which will more than compensate for any superior excellence it may possess. On the contrary, the farmer who allows his pigs a clover field, the gleanings of his orchard, and the benefit of his dairy through the summer; things that are worth little in themselves, will find them when the time arrives for fattening, well grown, and in good condition—in attaining which two things, nearly one-half the corn given pigs is usually consumed. In this state, when put up, little of valuable food is lost in the fattening; but the peas, barley or corn given them, ground or steamed, *tells* at once and perceptibly.

The introduction of the root culture, especially the ruta baga, has effected a complete revolution in the manner and profits of fattening cattle among farmers who are willing to be taught by experience. The saving in time and expense given in this way to the feeder, and the rapidity with which fat will be taken on by the animal that eats freely, would surprise one who had not tried the experiment. There existed at one time a senseless prejudice against the ruta baga for fattening cattle, grounded on the assumption, that the roots gave an unpleasant flavor to the beef. This notion may still exist among those who have not tried them, but twenty years experience in England and in this country, has shown the fallacy of such a supposition.

We saw a small cow knocked down the other day, that had been dried off late in autumn, put into good clover-feed for a month, and then fed with ruta baga for about the same time. She would eat a bushel in the morning, and another in the evening; and had a supply of good hay and salt, with occasionally a basket of soft corn, in the room of the turnips. The beef was of a very superior quality. and she gave one hundred and forty pounds of tried tallow. We do not mention this as any thing extraordinary; but, since the turnips at the most did not cost over six cents per bushel, it is evident the profits of this mode of feeding must be much greater, as well as made far less troublesome, than that formerly practised.

From the New England Farmer.

THIRD ANNUAL REPORT OF THE MANAGERS OF THE BOSTON ASYLUM AND FARM SCHOOL.

The managers of the above institution respectfully submit to the corporation the following report:—

The present board of managers was elected in the month of June last, and this report commences with that period.

The objects of the institution are presumed to be well understood. To rescue from the ills and the temptations of poverty and neglect, those who have been left without a parent's care; to reclaim from moral exposure those who are treading the paths of danger; to "place the solitary in families;" to give to those who know nothing of the ties or influences of home, some taste and fondness for a local habitation, at the least; and to offer to those, whose only training would otherwise have been in the walks of vice, if not of crime, the greatest blessing which New England can bestow upon her most favored sons, a good education, are some of the purposes for which the Asylum and Farm School was endowed. Under the blessing of God, success has thus far attended the exertions which have been made to accomplish these objects. From the monthly reports of the superintendent, and from the personal examina-

tion of the establishment on Thompson's Island, the board of managers are satisfied that there has been much improvement in the character of the boys who have been committed to the charge of the institution. In the last report of the superintendent, 62 boys are placed in the highest or first grade, 40 in the second, 4 in the third, and 1 in the fourth.

The number of boys on the island at the time of the last report, was 92; since that time 18 boys have been admitted, and three withdrawn. The number on the 1st of January, 1837, was 107; all of whom, as well as all other persons connected with the establishment on the island, were in good health, and there has been no death at the institution since the last report was made. The occupations and employment of the boys vary with the season. In spring, summer and autumn, the larger boys, in classes, work upon the garden and farm, of whose labor they perform a large part. The younger boys have small gardens of their own, which afford them recreation when released from school. In the winter season most of them attend school, where they are instructed in the learning usually taught in our common schools, and some of them assist in making clothes and mending shoes. The winter evenings are occupied with the study of geography, and the use of globes; botany, and practical agriculture; lecturing on different subjects, singing and reading. The superintendent states that "every boy in the institution is required to be present during the evening exercises, if he is able, which are very pleasing to them, and which we all enjoy very much."

A large number of mulberry trees have been planted upon the island, and there are many silk worms at the establishment. It is contemplated to improve the advantages of the location in the production of raw silk for manufacture.

As to the success of the boys in the farming operations, Capt. Chandler, the superintendent says, "they have succeeded far beyond my expectations; I think they have done more work, and done it better, than the boys of their age who have been regularly brought up to the business in the country generally do." And as to the comfort and contentedness of the boys, he says, "they are all confortably clad with woollen ciothes, shoes, stockings and caps, and appear to be as happy in their present situation as boys generally are under the paternal roof. They appreciate their advantages, and most of them are gratelul to the benefactors of the institution and their friends for placing them here. The boys are well supplied with books, and keep them in excellent order; our library contains between 4 and 500 volumes of well selected books. I have also an agricultural library containing about 30 volumes, to which the boys have access."

Opportunities are occasionally offered to the friends of the boys at the institution, of visiting them on the island in the summer months.

The school is under the immediate charge of Mr. George B. Hyde, and he as well as the superintendent and all engaged in the establishment, are believed to merit the continuance of the confidence which has hitherto been reposed in them.

During the past summer, several parties of ladies and gentlemen, at the request of the board of managers, visited Thompson's Island. At these visits there have been many persons present, and an examination of the boys in their different studies has been accompanied by some remarks on the objects and prospects of the institution. Among those who have thus visited the island, have been many strangers, who have always expressed their interest and pleasure in its objects and condition.

And how should it be otherwise than an object of interest? an institution designed to rescue the destitute orphan boys of our city from vice and ruin; to withdraw them from scenes and associates, whose contaminating influence would quickly destroy the perceptions of conscience, and leave them, deprived of that monitor, to pursue the impulses of passions which inevitably destroy their victims. Many are the worthy objects of the charitable institutions among us; our hospitals relieve the sufferings of the sick, and restore them to health and usefulness; they are a blessing which may be required by all of us, and we would not detract from their deserts. But we concieve that an institution which is to rescue immortal beings from the stain of sin, which could hardly otherwise be avoided, which is intended to have an influence on the youthful mind, and lead it to an understanding of its own capacities, responsibilities and hopes, deserves the fostering care of an enlightened, benevolent community, as much as those associations whose aim is to cure the diseases of the body, or to restore the wanderings of intellect. Such an institution as the Asylum and Farm School, is in true accordance with the spirit of the pilgrims; it carries into effect the first objects of their solicitude, the education of the young—of that young whose talents would otherwise be employed to violate the peace and virtue of society.

It will be seen by the report of the finance committee, that the expenses of the institution for the year ending January 1, 1837, have amounted to $6,100, while the receipts for the same time have amounted to 3,500, leaving a deficiency of $2,600. To meet this excess of expenditure over income, and to prevent its recurrence, it will be necessary to appeal to the liberality of the public. The board of managers had intended to have made that appeal in the autumn of the past year; but the condition of the financial affairs of this community induced them to defer it. They would recommend the subject to their successors as one requiring their attention when a suitable time shall have arrived for its execution, with the confidence that the appeal will be cheerfully and promptly answered.

For the managers.

WM. GRAY.

REAL FRIENDS TO AGRICULTURE.

With pleasure we again acknowledge the receipt of one hundred and fifty dollars, from the Rhode Island Society for the Promotion of Agriculture, to pay for the New England Farmer, for distribution among its members. Let other agricultural societies go and do likewise, and we promise them that our most earnest endeavors will be to render a fair and full equivalent.—*N. E. Farmer.*

Communicated for publication in the Farmers' Register.

PROCEEDINGS OF THE AGRICULTURAL SOCIETY OF BUCKINGHAM.

At a regular annual meeting of the Buckingham Agricultural Society, held at Robert Shaw's, Esq. on the 20th October, 1836, the meeting was called to order by Maj. Charles Yancey, the president, and after the reading of the proceedings of the last meeting, the president delivered the address in accordance with a resolution of the last meeting.

Resolved, That the president be requested to furnish a copy for publication in the Farmers' Register—also, that three hundred copies be published for the use of the members.

Resolved, That in future the exhibition of stock, &c. be on the day after the annual meeting in each year.

The reports of the committees were received, viz:

On Farms.

The first premium, to Col. Thomas M. Bondurant.

The second premium, to Dr. William P. Moseley.

The third premium, to Maj. James M. Patteson.

On Horses, &c.

The first premium, to Maj. Charles Yancey's Gohanna colt, 4 years old.

The second premium, to Maj. Charles Yancey's brood mare, Jenny Dang.

The third premium, to Maj. Charles Yancey's Greybeard colt, over 2 and under 4 years old.

The fourth premium, to Capt. William N. Patteson's Washington colt, under 2 years old.

The fifth premium, to Dr. William P. Moseley's Janus colt, other than thorough bred, under 3 years old.

The sixth premium, to Mr. Robert Moore, for jack, John Blue, over three years old.

Cattle, &c.

The first premium, to Capt. Richard G. Morris, for his Devon bull, Mitton.

The second premium, to Rev. Jesse S. Armistead, for his Durham heifer, Kitty Hossack.

The third premium, to Dr. William P. Moseley, for his fat cow.

Hogs, &c.

The first premium, to Col. Granderson Moseley, for the heaviest hog, live weight, under 1 year old.

Domestics, &c.

The first premium, to Col. Beverly A. Brown, for his blue suit.

The second premium, to Dr. William P. Moseley, for 20 yards carpeting.

The third premium, to Dr. William P. Moseley, for the best counterpane.

Election of Officers.

William P. Moseley, elected President; George M. Payne, J. S. Armistead, and Robert Moore, Vice Presidents: Granderson Moseley, Recording Secretary; William N. Patteson, Corresponding Secretary; James M. Patteson, Treasurer; William C. Moseley, Thomas M. Bondurant, Richard G. Morris, William Lewis, Jesse Holeman, and Patrick H. Elcan, Directors.

Resolved, That the proceedings of this meeting be furnished the editor of the Farmers' Register, and that he be requested to publish the same.

Resolved, That this meeting now adjourn till the 3rd Thursday in October next.

CHARLES YANCEY, *President.*
GR. MOSELEY, *Rec. Secretary.*

N. B.—The competition in cattle, hogs, sheep, and domestics, would have been more numerous, but for a misunderstanding as to the day of exhibition.

GRANDERSON MOSELEY.

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ADDRESS TO THE AGRICULTURAL SOCIETY OF BUCKINGHAM.

By Charles Yancey, Esq.

GENTLEMEN:—At our last annual meeting of the Buckingham Agricultural Society, when I was not present, you conferred on me the high honor of electing me your president for the present year: for your kindness and partiality in confiding to me this honorable station, I now tender to you my unfeigned and grateful thanks. In compliance with a resolution of the board, requiring me as your president, according to usage heretofore, to deliver an address to the society at its present annual meeting, I now proceed to discharge that duty with much diffidence, being fully aware of my want of qualification to do justice to the great and important subjects of agriculture, horticulture, and other subjects that I deem proper to include in this address. Agricultural husbandry, from the earliest ages to the present day, has ever been deemed, and wisely considered, as the nursing mother of the arts; and the basis of the comforts, prosperity, and the support of the whole human family. When our first parents offended against the first divine law of the Almighty, a curse was laid upon the earth for their transgression. That is, it was doomed to grow thorns and thistles, which I understand to be the type of the long list of every noxious plant that now infest the earth; consequently it was decreed, that Adam and all his descendants should "eat bread in the sweat of their faces"—that is to say, should procure the bread of life by labor, for the purpose that labor should be indispensable, to render the earth capable "of bringing forth its increase." It is then a divine command to labor: and I assert with confidence, that no manner of labor is more honorable, more independent, more certain of reward, more virtuous, peaceful and happy, than the cultivation of our mother earth.

How gratifying, how consoling, the reflections of those who sow and who plant, that are permitted by the dispensations of Providence, together with their own labor and toil, to harvest a bountiful increase of crops to the ample supply of their

household, and a large surplus to supply the wants of their fellow-men.

I consider slavery an evil of great magnitude, yet I am not in favor of abolition—very far from it. No remedy for the evil has presented itself to my mind, but would produce a greater evil to society, than a continuance of servitude in the mild and humane form in which it at present exists. The philanthropist, fanatics, and those who really entertain religious scruples, who have a knowledge of the relative duties of master and servant, as practised in Virginia, must all admit that the situation of our servants is greatly preferable, as to all ecsential comforts of life, compared with the situation and condition of the poorer order of white people, in the non-slaveholding states, and certainly much better than the condition of the free people of color residing among us, or their savage ancestors, naked and starved, roaming through the wilds of Africa like the wild beasts of the forest, deprived of the light of revelation, and all the social and endearing relations of civilized life. Slavery was introduced in this country, by the sordid policy of the British government, for which we of the present generation cannot be held accountable; but we are accountable for a just discharge of our duty as masters, in extending to them mild humane treatment, with a due regard to their morals. Abolition can never be forced by the clamor of fanatics, whieh can only make the situation of slaves less tolerable, and delay the process of public opinion, in devising some plan for commencing a system of abolition, which, commence when it may, must take its origin in some of the slave-holdiug states.

I consider one great objection to slavery to be, that by fashion, pride, and folly, the fathers of the land have relied mainly upon the reluctant labor of slaves for the support of their families, to the neglect of the important duty of rearing their sons to labor, either in the mechanic arts, or on the farm; to train them up to industry and economy, thereby lessening the inducements of vice and immoral practices—the bane of society, to which youth unemployed in some regular daily avocation, is peculiarly liable. Indolence is the mother of vice and dissipation, destructive of health, morals, and all the social relations of life, and the certain forerunner of poverty and want. Besides, slavery is an evil in this point of view; by means of slave labor, the most valuable region of country under the sun, has been worn down and exhausted by the culture of tobacco—a plant that yields nothing for the support of man or beast, a great exhauster, its culture very laborious, and certainly under no circumstances will it ever be cultivated by white labor. Furthermore, these people under humane treatment, the strength and vigor of the females acquired by moderate labor, multiply and increase upon us, faster than our means of procuring additional lands to work them upon. With a redundancy of labor for the extent of our farms, no plan of improvement can be advantageously adopted. The inquiry naturally presenting itself is, what is the remedy? I answer, lessen your force. There never was, and probably never will again, be a more propitious time than the present, to dispose of your slaves; and forthwith resolve to commence upon the improvement of your exhausted fields, by making and applying all the manure in your power, of animal and vegetable matter, such as corn stalks, wheat straw, and leaves taken from the poorest part of your woodland, designed for timber and not for cultivation. Much can be done in this way to increase your quantity of manure, and then rely upon clover and plaster, as the great auxiliary of the whole vegetable kingdom by which you can renovate your exhausted lands, and bring them up into good tilth again. Now gentlemen, let me intreat and beseech you to commence the clover husbandry as the only known process by which you can render your lands fertile; you must not mind the expense; the money expended will return to you with usurious interest, in augmented crops, and renewed fertility of your exhausted lands, and amply reward you for all expenses, time and labor employed. One of two things must of necessity be done, either to improve your lands, or sell the bones of your fathers, as too many have done, and exile yourselves and families from the attachments of nativity, friends, and relations, and make an unmanly retreat, to the fat lands of the south-west, where you will risk the diseases incident to a hot sun, and, perchance, to many members of your family an untimely grave. Now gentlemen, let me again conjure and entreat you, being sincerely desirous to promote your interest, and can, from many year's experience, recommend the clover system, as the best mode of improvement—to prevail on you, one and all, to adopt it the next season—to sow upon your wheat and oat land a gallon of seed to the acre, bearing in mind, that poor land requires more seed, as many will fail to vegetate. Poor exhausted places in your fields should have a dressing of some kind of manure, and be freely plastered; oats should be seeded thin, as they incline to branch much, of moist springs, when they will injure the young clover. My preference as to time of seeding upon wheat land is the last ten days of February; and when the land is much heaved up by frost, when rains will settle it down, and give a cover to the seed and insure vegetation. If the ground be dry, hard and compact, I recommend a light single horse harrow with white oak teeth, to pass over the field, which will greatly assist the seed in vegetating, and instead of injuring, as many would suppose, greatly benefit your wheat, especially if the roller is made to follow the harrow.

Young clover seldom dies for want of moisture till the grain crop is cut. If the season then be dry, having been sheltered and protected from the heat of the sun sufficiently, when an application of plaster, of from three to four pecks to the acre, will be very timely, and greatly tend to preserve the young clover. For the second application of plaster the next season, I prefer the time when vegetation is fully abroad, and the clover near heading; there is then more vegetable matter for the plaster to act upon. Clover and plaster should be like man and wife, never separated; for without plaster, the crop will be feeble and sickly. Every farmer must feed his land either with manure, or clover and plaster, or it will not feed him, and will withhold from him that increase which would reward him for his care and labor.

Hoof nor tooth, should be put upon clover before it is in full bloom—at any earlier stage is very destructive: and never at any time graze clover in the first year of its growth. I mean, when in

bloom the second year, when if the crop be heavy, there will be more clover than the plough can well turn under. It will then not be bad management to permit your stock to derive the benefit. Sheep and hogs injure less than horses and cows. I will suggest to you that all good managers sow clover to improve their lands, and not for the purpose of grazing.

It will readily be perceived by you all, that the old three-shift (or land killing) system, must be abandoned; for with less than four shifts, the clover husbandry ought not be attempted. Five shifts is much better—but with those who lack surface commensurate with their operating force, by forming grazing lots of from two to four acres each, according to circumstances, upon lands adapted to grass, and sown with greensward, orchard, and herdsgrass—as different grasses mixed, succeed best in forming the strongest and most durable turf to resist hoof and tooth, under annual grazing. Twelve acres in such lots, well sodded with these grasses, will keep more stock than a common hundred acre grain field: say six lots of two acres each; three are to be under grazing at the same time; when eaten down, turn in upon the other three; when they are consumed, the first three will again afford a good bite. These lots can be enclosed by hurdles, sufficient for three lots, by removal as you change your stock, and may be kept up for a series of years, by cutting the turf every three or four years with a coulter plough, and an annual dressing of plaster, with a top dressing of manure occasionally. With the aid of such lots, the four-shift system can be made to answer tolerably well. Five shifts, I prefer to a greater number—for experience and observation teach me to believe that our lands will require a hoe crop to cleanse them every fifth year. If permitted to lie longer, they become foul and wormy, and overrun and infested with sassafras, locust, briers, sorrel, blue thistle, and St. John's wort, &c. requiring great labor in shrubbing and preparing the ground to receive a crop.

Clover hay I consider equal if not superior to any other kind of hay, and readily made in fair weather. A very common error in curing it, is exposing it too long in the sun, which parches up the leaves and makes the hay poor. It is better to sun less, turn it every hour so as to make a fresh exposure to the sun through the day—at night, before the dew falls, cock it up in convenient hand stacks, there let it remain two fair days, and it will be cured by its own heat and the air, when it ought to be hauled in, and if any part be not sufficiently cured to keep, a little exposure upon the yard will make it safe to place away in the hay house, or in a rick—if the latter, it should be sloped off like the roof of a house, and covered with straw or top fodder—otherwise, the hay will sustain damage by rains. I estimate a quantity of well cured clover hay equal to the like quantity of sheaf oats, especially if cut, as the oats usually are, and ought always to be. Hay when cut like oats, is less subject to waste—the stock eat it better, and derive additional nutriment, perhaps, equal to 10 per cent. It is admitted by the best farmers, that oats make a hasty and heavy draft upon land, and that clover is an ameliorating crop, drawing much less from the land, growing and sustaining itself upon atmospheric air and moisture, and known to be the greatest improver in the whole vegetable kingdom. It would then seem to be good economy to lessen the oat crop, and substitute clover hay.

The manner of planting and cultivating corn is believed to be well understood, consequently I shall be brief upon this subject. There is no doubt that one stalk of corn will grow better by itself than two stalks together; from which it may be inferred that it is best to drill, upon lands of every quality. I think otherwise; and will advise that such lands as will produce 20 bushels, and upwards, to the acre, only, should be drilled, excepting hill side land, regardless of quality, should always be drilled in a horizontal direction, to prevent washing; and leaving your plants asunder in the drill, according to the strength of the soil, from nine inches to two feet and a half. Upon lands a grade lower in tilth, I would plant and cultivate three feet six inches each way, which is as near as can be conveniently ploughed. And upon lands a grade lower in quality, four feet each way, and in both cases, a single stalk. In planting corn in drills, I advise that the beds be opened deep, and the corn planted as deep in the bed as the surface soil. A higher elevation, near the top of the bed, greatly exposes it to want of moisture in dry seasons, and much more liable to blow down in stormy weather. To drill the whole crop of corn, does not suit tobacco growers, as it requires much more hand hoeing, and at a season when you are busy putting up tobacco hills and planting tobacco. Ashes is a most valuable manure for corn; a pint of which, put underneath your corn in planting, and a little earth drawn over the ashes before dropping the corn, I believe, upon old exhausted land, will increase the crop one-third in quantity. As to the effect of common manure you are all well informed. Corn land should always be harrowed down before planting, which working is as valuable as a ploughing after the corn is up. In the first place, it prepares your land to receive the seed corn, and in the next place it destroys a young crop of grass and weeds, which will permit you to delay the first ploughing, and consequently the second, without injury to your corn, and enable you to embrace the whole grass-growing season, and make good corn with two ploughings, which if well done, and done at the right time, no more ploughing will be required; the cultivator then, will destroy a young crop of grass, and level down your land in good condition for seeding wheat. From experience I am of the opinion that seed corn should be saved from stalks that have produced two ears. Whether it be sex or not, I cannot say, but have observed it is most apt to produce its like, and that likeness increases as you continue the process.

My plan to prevent crows and blackbirds from pulling up the corn, is to soak the seed corn in copperas water, made strong—to remain in it till the grain is somewhat swelled and turned black. It is thus rendered obnoxious to those birds, and vegetation greatly expedited. I consider this method preferable to tarring corn, which, if smeared entirely over the grain, makes it impervious to moisture, which will cause it to rot, instead of sprouting.

I advise a change of grain for seed about every seven years; but an exchange with neighbors, cultivating the same kind of land, will not fully answer the purpose; a change of seed should be

sought from lands of a different description from those designed to seed upon, and it is thought by agriculturists of much experience, that seeds and plants brought from a northern to a southern latitude, flourish and succeed better than those brought from a southern to a northern latitude. Time and experience will decide the question. The wheat crop with us is a delicate and uncertain one. The best means of success is to improve your lands which have been so long and so hard cropped under the three-shift system with but little aid, that the portion of lime it formerly contained is entirely exhausted. Under this impression, I recommend a free use of lime, a constituent part of wheat, and very essential to its growth. Small seed of every kind require a high preparation of land to insure a good crop; then prepare your wheat land well, and seed, if possible, in all the month of October, regulating seed according to the fertility of the land, from four to seven pecks per acre—the latter is sufficient for our richest bottom land; and exhausted land that will not bear four pecks to the acre ought not to be sown in wheat, but with clover the last of February, and well plastered in March, together with a top dressing of coarse manure. The opinion, entertained by many, that clover requires the shelter of a grain crop to protect it from the sun, is not well founded. Many of you, no doubt, have seen as good clover where your corn piles stood and not seeded in wheat, as that which had been sheltered by the wheat. It is admitted that young clover is much more subject to die upon poor, than rich land: the best protection against the sun and drought, is a free application of plaster and manure. Lands not sufficiently waving to carry off water quickly, should be well bedded, and water furrowed in every direction necessary to vent the water. They should be attended to throughout the winter, after sudden thaws and heavy falls of rain, which will choke up the furrows and cause damage to the wheat. Lands that are subject to heave up by frost, should be rolled, with a roller 18 inches in diameter and 4½ feet long. This operation, too often neglected, will amply pay you for the labor. Any application of manure is better in a top dressing, about the first of March, than to be ploughed in before seeding.

From long-continued culture without any improvement, our corn fields are greatly deteriorated, and will not yield a plentiful supply for the use of the family. The first great and certain remedy, is to increase the fertility of your lands; and the second remedy, is to use economy; for there is more judgment in feeding out a crop of corn, than there is in making it. A great saving will result in grinding all your stock corn, into fine meal, and feeding it mixed with cut hay, fodder, shucks or straw; in this form, I estimate three quarts equal to four of corn, a saving of 25 per cent. to those who have mills; to those who pay 10 per cent. toll, a saving of 15 per cent., an object well worth your attention, and I hope many of you will test the estimate, fully believing that all who do, will concur with me in opinion; and I will further add, that when fed in this form to old animals that chew corn imperfectly, the saving would be one half. Much can be done in aid of the corn house, by cultivating largely, for the use of stock, the bulbous roots, the mangel-wortzel, the round potato, and turnips; the former is said, from one acre, to produce fifty tons weight, including tops and roots. The leaves are large, and will bear three cuttings in the season, to be either used as summer food, or cured into hay and preserved for winter use. I have raised them to weigh fourteen pounds, which is not near the heaviest size. I have no doubt, that from an acre really made rich, the plants set in rows, two and a half feet apart, with twelve inches space between them, and well cultivated with a coulter plough, with the necessary hand hoeing, would produce a greater crop than could be raised from any other vegetable whatever. The round potato is indiginous to this continent, though improperly called the Irish potato. It is a root of great value, adapting itself to almost every climate, sustaining more of the human family, than any other root in the world; and good food for cows and hogs. The turnip is a poor watery root, possessing but little nutriment—by boiling it, root and top, it is freely eaten by cows and hogs, and serves to fill them, and afford some nutriment. The keeping of animals full, is essential, either in fattening them, or in preserving their present plight. Feed a horse extravagantly upon corn alone, and you cannot fatten him without a due proportion of long provender; and if that be withheld from him a few weeks, he will become unhealthy. The pumpkin is very superior food, being much more nutritious than the turnip, and is eaten by horses, cows and hogs, and much less injurious to lands upon which they grow. They delight in a light sandy loam, and in good seasons are very productive. You will increase the crop by plucking off the first blossom nearest the root-stalk, for if that is permitted to form a pumpkin, it impoverishes the vine throughout its whole extent.

Tobacco being our great market crop, it will be expected that I treat upon the culture and general management of that plant. It being very important to have forward plants, the best selection of suitable ground for your plant beds must be made. New virgin soil is preferable where to be had, with a southern exposure and the command of water, where practicable. With the command of water and good fresh horse manure, plants can be raised early, and in despite of the fly, that are, in dry cool seasons, so destructive to our plants. I prefer a close fine soil, with as little sand as possible: rather than a light puffy soil, I would take black-haw swamps, or white-oak land, which are inclined to be adhesive and somewhat cold, with shallow soil. I will here remark, that such a soil, with the aid of manure, will produce your plants with better roots than native rich land: such land, when well burned, will divide its particles to great fineness, imbibe and retain more of the stimulus imparted to it by the action of the fire, and retaining its close compact nature, yielding moisture to the roots of the young plants, which in an open light soil, would be evaporated by the sun and drying winds of March, when the plants perish. The next process is burning; the extent of which the best rule I can give, is to burn till the ground assumes a red appearance; bearing in mind, that burning late in February, and early in March, must be less than what would be called early burning. The largest coals must all be taken off with a fine rake, then hoe up your bed, not exceeding two inches in depth, and avoid turning over the soil. Now put on horse manure all over your bed, then chop over with the hoes repeatedly,

until the ground is reduced sufficiently fine, removing all the roots that can be got out, large and small, taking care not to rupture the substratum by pulling up large roots; mark off your bed, and sow a common table spoonful of tobacco seed for every hundred square yards, dividing your seed, and sowing one-half lengthwise, and the other half crosswise, by which means you will sow your bed more regular; tread and cover well, and you may expect plants in due season, provided you give another dressing of horse manure, made fine enough to sift through a basket, when your plants are generally square, and at the time when rain is expected. Seasons for setting plants being uncertain, we usually embrace seasons in the month of May, yet I greatly prefer planting from the 1st to the 15th of June. It will come to the knife sooner, and make larger and better tobacco, than if planted in May. Tobacco requires early and deep working with a coulter plough first, then with a scoope to make fine earth, and instead of the old mode of ridging down, it is much better to hill it. At the second working, plough and hill in the same way, and if well done, and at the right time, it scarcely will require a third working. All the necessary working should be performed by the time your plants are in the second suckers; after that period, a working is often prejudicial. Young grass in that stage of its growth will not injure; indeed, it defends the plants from dirt upon the bottom leaves, and will cause it to ripen of a yellow grey color, and make tobacco of a finer fibre, and more easily cured. Weeds will injure, by the winds whipping the leaves against them; they should be plucked up by the hands when suckering. I recommend low priming and topping—the shorter the stalk, the richer the tobacco. Take out the bud as soon as practicable, without crippling the bud-leaves. In my opinion, eight leaves is better to top to, than any greater number, even upon rich lands; it will make richer tobacco, more certain to make itself, and come to the house before frost, than any greater number of leaves. It is often seen upon weak land in dry cool seasons, the two top leaves of ten-leaf topping will not ripen, and they ought to be the two best leaves upon the plant—when, if eight-leaf tobacco had been in the same hills, it would have ripened to perfection, with longer and broader leaves, richer, heavier, and every way better tobacco. Besides, it will come to the knife two weeks sooner, making the crop much more certain, and enable you to seed your tobacco land in wheat that much sooner, which is a great consideration with every farmer.

A very great and common fault in tobacco makers, is cutting tobacco before it is ripe, by which the loss is great, in quantity and quality. In an address of this kind, there is much difficulty in giving you a criterion, by which to know certainly when it is really ripe—for tobacco often assumes the appearance of ripeness (especially in dry weather,) when it is not ripe. I will, however, say, that when most planters think their tobacco is ripe, if they would delay cutting one week longer, it would then probably be ripe. I will draw your attention to the point of the top leaf on the north side of the plants. From the stalk to the declining part of the leaf, you will see yellow spots, which is the oil separated from the water; from thence to the point, if green in color, it is water only, and ought not to be cut until the oil has reached the point of the leaf. There is as much difference in a chew of good ripe tobacco, compared with a chew of half ripe, as there is in a ripe and half ripe water-melon. Unless the intense heat of the sun forbid it, (such heat as we had in the last month,) I always scaffold tobacco. As to the time when it ought to be housed, and fire applied, nothing is more indefinite, depending upon the degree of ripeness, the kind of land on which it grew, the strength of the sun, the state of the air, whether dry and cool, or warm and moist, and whether it ripened of a yellow-grey, or green color; the latter always containing more water, and longer before the water and oil separate. The best guide is this separation, the water having escaped through the mouths of the leaf vessels, where you see the yellow spots of essential oil, and the remaining green and watery part of the leaf approaching that process. A slow fire and weak heat must be applied, say eighty degrees, for if your tobacco gets too yellow, the vessels become so open, the least degree of heat too strong, will force out the oil with the water, kill the staple and cure it up red, the most worthless kind of tobacco that is made, there being no essential oil in it, in which the value of tobacco entirely consists. That degree of heat ought to be continued, but not increased, one natural day; after that toasting, the tobacco is prepared to bear an increased heat of five degrees more, the next natural day; the third day 90 to 95, and the fourth day 105 to 110 degrees, which ought by that time to cure the leaf perfectly; but of that fact be certain, by a nice examination above the joist, where the process of curing is the slowest, before you raise heat to 140 or 150 degrees, which is necessary to reduce the stems; even a greater heat if your tobacco is very large. There is then no danger of injuring your tobacco; the mouths of all the vessels are sealed up, no oil can escape, and your tobacco will be finer in fibre, closer in texture, and the large stems well reduced, exhibiting a fluted appearance instead of round, a sure proof that all the water is evaporated. Partly cured stems have, and will deceive even good planters, as to the right order to strike down for pressing. It is the moisture retained in the stems, that imparts itself through the leaf, as warm weather approaches. Of the different degrees of heat of which I have spoken, much depends upon the tightness of the house, and ought to be regulated by common sense observation.

Never crowd your tobacco either upon the scaffold or in the house—ten good plants is as many as ought to be hung upon a stick: if small, go to 12. When arranging in the house to fire, give a space of ten inches between, and it is best to cure in the body of the house, commencing upon the joist; when the leaf is cured, raise it up in the roof, when 4½ inches space is sufficient—if house-room be scarce, fill the body again with your next cutting—the firing of that, will cure the stems of that above. No man can cure as good tobacco in the roof as in the body of a house, a dry heat curing best. The tier next to the fire will be best, if heat be applied right—the steam passing up through so many tiers of tobacco, from which the water is constantly issuing out, before it passes the joist, the steam becomes vapor, and being confined some time before it escapes through the roof, has a deleterious effect, which, if not prevented, by a constant and sufficient supply of heat, to dry off

the moisture upon the plants, house-burn ensues, when then the leaf perishes on each side of the stem. The curing of tobacco is a nice chemical process; yet it is generally entrusted to illiterate managers and ignorant negroes, neither knowing the first principles of the science. The constituent parts of tobacco, are wood, water and oil; and he who dries the wood, evaporates the water, and preserves the oil, in the best manner, is the best tobacco curer.

I am inclined to believe from observation, that most farmers keep more horned cattle, than are useful or profitable. It can scarcely be said, that we have a market for beef; an indifferent one for butter, and none for milk. Our cattle are only useful for a family supply of those articles, and for work oxen: and being very prejudicial to improvement, a subject of first importance with all of us. Would it not be good management to lessen the number, and keep the balance better? and would it not be still better to substitute your old field scrub cows, with some of the improved strain, the Durhams, Devons, or Herefords, one of which to the pail, would give as much milk, and upon the same keep, as three of your ordinary scrubs?

Permit me to invite your attention to the blooded horse, an animal every way, and every where, superior to the cold blood; possessing more strength and activity, better resolution and action, better form, wind and elegance, more docile and tractable, better under the saddle, in the carriage, on the turf, or in the plough.

CHARLES YANCEY,
President of the Buckingham Agricultural Society.

SKETCH OF THE TRANSACTIONS OF THE RECENT AGRICULTURAL CONVENTION OF NEW YORK.

To the Editor of the Farmers' Register.

Kinderhook, Saturday evening,
February 4th, 1837.

Dear Sir:—As you have been pleased to express an interest in all our proceedings that tend to the advancement of agriculture, permit me—immediately on my return home from the meeting of our Agricultural Convention, and Agricultural State Society, at Albany, while my recollections are vivid, and the emotions excited by our interesting discussions have not yet subsided—to give you an account of our doings. I have neither the minutes nor the time, to give you a detailed statement; and as I write from memory, it will not be a particular account of all that was done.

We met on Thursday, the 2d inst., at 4 P. M., in the Assembly Chamber, shortly after the adjournment of the house, which, at this season of the year, is in session. On looking around, it was extremely gratifying to see the numbers in attendance; the body of the large room was filled; the seats of the members all occupied; around the fire-places numbers thronged, while the lobby and gallery contained many listening and apparently interested spectators. As by far the greater number of delegates were strangers to each other, this want of acquaintance caused an awkwardness in our preliminary proceedings, from the fear, that in the distribution of the offices of the convention and the appointment of committees, each portion of the state would not be duly represented; for we soon found that distance had been no obstacle to prevent the attendance of delegates, as many had come from one hundred to three hundred and fifty miles for that purpose. The very thought gave an interest to our acts, that gentlemen would travel so great a distance in the depth of winter, to to be present at the meeting of, at most, two or three days of an agricultural convention.

Immediately after the organization of the house, several resolutions were offered creating the necessity of the appointment of committees to act upon them. Some of these were upon topics that could, in a few hours, be reported upon; but others involved inquiries that would lead to more thorough and minute investigation. They were all of a nature to call forth whatever of talent or knowledge we possessed; and when these reports shall be given to the world, which I think in due time they will be, it will be acknowledged that our labors have not been without beneficial results. Suffice it to say, they created distinct topics for report and discussion, and all had an important bearing upon the great and varied interests of agriculture. I will give you the leading features of a few of them.

We resolved to solicit aid from the legislature for an appropriation to be applied in awarding premiums for the exhibition of the best specimens of agricultural products in the different counties in the state;

For aid to establish our agricultural school;

For the appointment of a committee to inquire into *what* is the most useful application of the public money to be expended in the improvement of agriculture;

What progress has been made in becoming acquainted with the habits, and preventing the destruction of our wheat crops, by the "*vibrio tritici*," or wheat worm;

Unanimously resolving to recommend the work of Mr. Taylor, on agriculture, as one of the elementary books to be used in our schools;

Recommending the silk culture, and inquiring what progress has been made in it in this state the last year;

What advances have been made in the subject of the beet culture;

What late improvements have been made in our farm implements;

What are our most useful kinds of stock, and what are the best modes of improving them;

For an inquiry into the statistics of our agriculture; to know why it is that foreign wheat, rye, oats, barley and hay, have been imported the last year for the consumption of our population, we being peculiarly an agricultural people;

Requesting a communication from the geologists appointed to take a survey of this state, with such a statement of appearances as have been presented to them in their tour thus far, as far as those appearances bear upon agriculture.

I have thus briefly presented some of the topics: there were others introduced which I do not remember, but upon subjects quite as interesting. Time was given to make out elaborate reports upon many of them, and gentlemen appointed both competent and willing to enter into details. When they appear, I trust they will embody a mass of information that will serve as land-marks in our future course. Many of these, and other re-

solutions offered, elicited a good deal of interesting discussion, which evinced not more zeal than there was fact and talent to support it; and while many of the speeches were creditable to those who made them, the audience were both gratified and instructed with the manner and matter in which the ideas were clothed and presented.

A few specimens of domestic silk in the skein, of almost all colors, with twist, and manufactured handkerchiefs of white and variegated colors made from the worms fed upon the leaves of the native white and red mulberry, were shown. They were excellent in their kind, both in quality and workmanship. Here was proof positive that excellent silk could be made from the native mulberry; and I have long thought that our indigenous mulberry being suited to our climate, will supercede all the imported varieties. At all events, it will take a succession of years, and much loss, to acclimate the others; and until then, if we do not use the native, we cannot perfectly succeed.

Two instruments, apparently very perfect in their kind, among other things, were offered for the notice of the convention. One was a machine very simple in its structure, and apparently perfect in its operation for reeling the silk from the cocoons, twisting each filament, and forming as many of them into a thread as may be required, the threads multiplied, and all done by one operation. The convention were very much pleased with its performance, as the manufacture appeared so easily and perfectly done, as the thread was made in their presence. Depend upon it, the Americans will excel the French and Italians in a few years in the growth and manufacture of silk. There is an enterprise, an ingenuity, and a facility in our countrymen to accommodate and seize upon circumstances, which is not so apparent in other nations, and their inventive ingenuity will soon throw aside the cumbrous and complicated machinery for the manufacture of silk, which is considered so indispensable to an European.

Green's straw-cutter is an excellent article: it performs its work, as such things ought to do, well and quickly. The specimens shown, were very much approved of. Its use, you know, is to enable us to keep over the winter one fourth more of stock from the same quantity of provender, than we have heretofore done. If the principle is carried out into practice, it will give millions more of profit every year to our farming population.

A beautiful female Angora goat, imported from France, was exhibited to the members of the convention: (the male was lost on the passage.) I think the animal will do well in this climate. The one shown was in high health and condition, and its fine coat was long and thick enough to protect it against the severity of our winters. It has a warmer covering than a sheep; for next to the skin it has the fine wool of the Saxons, and growing through it, a long hair, soft as silk and twice as long as the wool of the Bakewells. If the animal thrives in this country, of which there is every probable appearance, it will be an acquisition that will add immensely to our wealth.

Of the meeting of the Agricultural Society, I have said little, as it was in a measure merged in the acts of the convention. This was very desirable, as the members of the society were few in number to those of the former. We, however, transacted our usual business, and to give the public an opportunity to hear our annual address, adjourned from the City Hall, where it was held, to the Assembly Chamber, for that purpose. The subject of the address by Dr. McNaughton was a history of agriculture. It was a very creditable and satisfactory performance—was listened to with deep attention, and a copy requested for publication. I do not know that I can enter into farther details. Our excellent agricultural journals, will, no doubt, give a more full and perfect history of the proceedings of the state society and this convention. Their readers, I am satisfied, cannot have more interesting matters spread before them; and it must be extremely gratifying to the editors of those journals, as it was to the members of the convention to have so large and respectable a delegation attend; for it was a proof that they have excited an interest in the improvement of agriculture, which was fully shown by the numbers present, and the talent elicited during the course of our proceedings.

I had previously come to the conclusion, that this would probably be the last agricultural convention necessary to be held for some time, and that it would be best to merge it for the future in the state agricultural society. But at our close, one feeling seemed to pervade the assembly—that was, that we would not meet the expectation of the public, and certainly deny ourselves great gratification as well as instruction, did we not adjourn to a future meeting. It was, therefore, unanimously resolved, that we stand adjourned to the first Thursday of February next, which God grant we may all live to see.

I remain your friend, &c., &c.,

J. P. BEEKMAN.

[What a subject for gratification and pride does the foregoing sketch furnish for a citizen of New York! and what cause for humiliation and shame, for a citizen of Virginia, in the marked contrast presented at home!

Compare the numbers and the animated zeal—the labors and the expected results—of the recent and previous Agricultural Convention in Albany, with the thin ranks, and feeble action, of the one held in Richmond last winter, and the attempt, totally abortive, to hold another there last month!

In New York, one agricultural publication of Virginia—the translation of Puvis' Essay on Lime, prepared for and first published in the Farmers' Register—has already been republished in a separate edition, and distributed gratuitously to the farmers of that state, by the munificence and public spirit of a single individual; and now, the convention have recommended that Taylor's Arator, a work altogether Virginian, shall be made a text book in their elementary schools. In Virginia, the last named of these works is nearly out of print, and there has been no demand for a new edition in the last twelve years: the former, (M. Puvis' Essay,) though republished in every northern agricultural journal, in addition to the separate New York edition, (published for gratuitous distribution, at the instance and expense of James Wadsworth, esq., of Geneseo,) has been circulated in Virginia no further than in the pages of the Farmers' Register.

Further comment would be both painful and superfluous.]

ON THE CAUSES OF THE LONG-CONTINUED DECLINE, AND GREAT DEPRESSION OF AGRICULTURE IN VIRGINIA.

No. I.

Political causes—the prevalence and effects of party spirit.

To the Editor of the Farmers' Register.

I feel an earnest desire to address my brother farmers and planters, throughout the state, on the *causes of agricultural depression in Virginia;* and knowing no better way than through your widely circulating publication, I now ask your permission to do it. My letter would have been sent, as a matter of course, and without any such request; but I recollected your general interdict against political remarks, unless they were closely and obviously connected with our own interests; and therefore I deem it necessary to premise, that every sentence which I shall utter, of a political character, will be—as I most sincerely believe—in strict accordance with this pre-requisite; for they will be applied to *every* political party which ever has existed in Virginia since my recollection, and solely with a view to prove the baneful influence upon our agricultural interests of *all* political party-spirit, however popular may have been the title, or artful the disguise, under which its true nature might be concealed.* I have my preferences, like other people, in regard both to the principles and practices of *all* our parties, past and present; but in *one* respect, and that of the greatest importance to the general good, I think, there is no difference between them. It is in their adoption of the fundamental principle—the "*sine qua non*," without which, (according to my sense of the term *party*,) none could ever exist at all. This principle—than which none can be either more base or ruinous—is, *that individual conscience and judgment must both be sacrificed to party dictation.* But party men contrive, in some way or other, to reconcile themselves to the practice, by another dogma equally false and pernicious, which is, that party of some sort is indispensable to preserve their country and its government, and that they *must* preserve the party which they think right, and *above all*, that *its preservation* absolutely depends upon their unanimous support of all the measures of its acknowledged leaders, whatever their individual opinions may be in regard to the certain tendency or probable effects of the measures themselves; these being matters with which their votes have nothing to do, after such measures are decided upon at head quarters. With this assurance of my sincerity, which I am perfectly confident that *you*, at least, will not doubt, I will proceed with the *professed* and *real* object of this communication, (two things by the way, which are often as opposite as the faces and points of destination aimed at by the rowers of a boat—) two political and moral sins, moreover, which every individual of every party commits whenever he suffers others to control either his words or his actions, in violation of his own moral feelings and deliberate judgment.

The causes of our agricultural depression are so numerous and so nearly equiponderant, that it is quite as difficult to know where to begin as where to stop in the enumeration. Yet I have resolved to make the attempt, although, many perhaps may be inclined to accuse me of a similar folly to that of "locking the door after the steed is stolen." Be this as it may, I will hazard the effort in the confident hope, (vain as some may think it,) that there is still left among us enough of old Virginia patriotism—old Virginia energy, and love of our native homes, to encounter all our difficulties with a fixed determination to overcome them, if possible; and with full faith that *most*, if not *all* of them, may be overcome, merely by cordial exertion and untiring co-operation. If only a moiety of the few old times people yet left, and who have not entirely despaired of the commonwealth, could be roused to the undertaking, they would probably still have influence enough over the good men and true, of the rising generation to "rally them to the rescue." Most glorious and happy would be that day, should it ever come; and that it might, is certain; for the selfishness which causes men to run away from a house on fire, instead of aiding to save the inhabitants, or the instinct that drives rats from a building about to tumble down, has not yet, (thank God,) frightened away all the true sons of our good old mother Virginia. Enough

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* We mean to adhere to our rule of admitting nothing of party politics, no matter on which side—and by such course of exclusion, we have already several times given offence to partizans on both, and have been charged as being hostile sometimes to one, and sometimes to another, of the most opposite political opinions. We have even lost subscribers, not only from the opinions which we entertain, and in our private capacity assert, and mean to continue strenuously to assert—but also for its being *supposed* that we were friendly to such as in truth we are entirely opposed to. Condemnation on such conflicting grounds, is proof that this journal has deserved it on none. Still, we have always claimed for the Farmers' Register, and will continue to exercise the right, of either condemning or applauding any measures of government, that we conceive to be injurious or beneficial to agriculture.

But strong as may be the censure conveyed in the remarks of our correspondent, they do not transcend, nor even approach, the limits of political remark which we have indicated above, and frequently have stated on former occasions—because they apply to *every* party through *all time*, for more than thirty years. But it may be charged that the censure is designed to apply to the present dominant majority in our legislature, because they *have* the power to act for the benefit of agriculture, and *do not*. This is evidently true—but still we deny the inference to be correct, that the denunciation is on party grounds. For if the places of the parties were this day changed, and the present minority should acquire the power of the majority, does any one imagine that the change of power to other hands, would give more aid to agricultural improvement? *We* certainly do not; and (from the general tenor of his remarks) neither does our correspondent—and we farther would concur in applying all the censure expressed on this head, to the *outs* no less than the *ins*—to all minorities as well as to all majorities, in all the long time that Virginia has been a prey to the fierce contentions of party spirit.—Ed:

of them are still left, if they will only unite, with body and soul, to prolong the life and restore the health of our common parent.

Where evils are not altogether overwhelming, not such as entirely to astound and paralize us, the first step is steadily to view and thoroughly to understand them. The next is, to determine that no obstacles, however formidable—no circumstances, however discouraging, shall deter us from the effort to conquer them, if we believe them to *be* conquerable; and the last should be, the immediate adoption of such means as our best judgment may suggest for their removal. In obedience, therefore, to this doctrine, (which is one, thank heaven, that no party politics can possibly nullify, or I should give it up,) I will now proceed to state and to expose, as far as I am able, the causes of decline in our agriculture; indeed, I may say, in every branch of Virginia husbandry. Of these, the most prominent by far is, the utter destitution of legislative aid, with the exception of the sort of Irish bull law—making the *waters* of the Appomattox a legal *fence;* and the old *fence-law itself,* passed, (if I mistake not,) before the organization of our federal government, which was a very apt exemplification of the old story, that the devil being called in to mend a dog's hind leg, broke it in another place! I pronounce this absence of legislative aid the most prominent cause, because it stands in such strong and deeply mortifying contrast with the patriotic policy of several of our sister states, and especially of New York, which is now reaping from that policy the richest rewards that agricultural wealth and prosperity can confer on any government which makes the great interests of agriculture, the chief object of its regard. Heretofore, as far back as I can remember, the contemptible cant, so insulting to the intelligence and patriotism of the people themselves, of "*not taking the people's money out of their pockets,*" for any thing but the unavoidable expences of their government, even though the expenditure would procure for them, in the opinions of the wisest and best among them, innumerable moral and political blessings—far too great to be estimated by dollars and cents—has served as the despicable pretext for not expending a solitary cent towards promoting that vital interest which keeps in healthful circulation, the life-blood of all the other great interests in the community. *Agriculture,* the main stay and support of the whole, has been left entirely to shift for herself; left too, by those called the guardians of the state, the zealous promoters of her prosperity and happiness. True they have always given her a vast deal of lip service, immeasurable out-pourings from slang-whangers of all grades and dimensions—lauding her to the skies, as the best—the kindest—the most bountiful of mothers—God, bless her! But beyond that, the history of their proceedings, so far as she is concerned, presents an entire blank. Had there been the least particle of sincerity in any of these *ad captandum* vaporings—these pleasant ticklings of us gudgeons,—the agriculturists of Virginia,—something for our benefit would certainly have been done. And were there, even at this time, any real friends to agriculture in our public councils, *now surely* is the season to manifest their regard by some well-matured, earnest and zealous efforts, to aid our cause by pecuniary means; for an immense sum has lately come into our public coffers, which all the legislative brains of the state have not yet, I believe, been able to determine how to use. Still, not a solitary word have I ever read in any of our newspapers, of *any* party whatever; not the faintest whisper have I yet heard from any of our guardians and protectors in favor of applying, even a single cent towards the encouragement of *that* all-important interest, to which, principally, these gentlemen owe their present political existence. Do I blame *them* for this most fatal neglect? Not at all. *We, ourselves*—and I say it in condemnation of *all* the political parties among us—elected them to make the fighting and gaining political party battles the chief object of their proceedings; for the only test by which was tried their fitness for legislation, last spring, was to demand of them—"Are you for Van Buren, for White, or Harrison?" None, then, who have had any concern, (and who has not had *some?*) in substituting such a test for the proper one, and thereby most fatally perverting the sense of legislative duties, should for one moment, blame their representatives for fulfilling the purposes of their mission so faithfully as they have done, ever since the memorable contest between the elder Adams and Mr. Jefferson, when this most vile and pernicious practice was first systematically adopted. At this period, since it has become thoroughly established, it would be utterly useless now to inquire, who began it; for that probably would only aggravate the evil. None can deny that they do not both see and feel it most deeply; still less can they deny its disastrous effects, although each party labors to acquit itself of all blame, by imputing the whole to its antagonist; as if they believed the people such fools as not to know that no feud or quarrel whatever, can long be kept up without *both parties being to blame,* no matter which committed the first wrong. If any affirm that *I* have made our party quarrels older than they really are, will they please to name any single session of our legislature since the date I have assigned, when the members thereof did not meet like so many game cocks, fully prepared for mortal combat, and waiting only for the pitter's signal to commence the deadly fight? Do the party-combatants of the present time show any abatement of vigor in attack or defence—any intermission of reciprocal hate—any less ardor in waging their destructive warfare? The question will be immediately answered by taking up any party-newspaper you please; and I will submit to be called a defamer, if the adverse parties in our legislature are not found engaged more than half their time, in perfect obedience to the principles on which they were elected, in a war of mutual political extermination, leaving, *ad interim,* all the great interests of the state to take care of themselves, or to receive their attention too late to do any good.

It needs no wizard to point out the disastrous consequences to all interests, but especially to ours, of such an utter perversion of the true principles of representative government. These surely require, that *the good sense, the knowledge, and the virtue of the people should be represented—not their prejudices and passions ;* for when *they* govern the constituent body, the representative body must necessarily be like their masters, the slaves of similar irrational and ruinous impulses ; and the conduct of both parties will co-operate directly to defeat the very end of that species of govern-

ment, called representative, which end is the good of the whole nation, whether their polity be consolidated, or federative. Another fatal effect of this state of things is, that the great qualities of moral worth, good talents highly cultivated, love of country, and devotion to all its best interests, are no longer, (as they ought to be,) made the essential, the indispensable qualifications, for our public functionaries; but the thing first sought for—the thing preferred to all others—is, a staunch, undeviating, reckless adhesion to political party. Yet the most stupid among us know perfectly well, that much the greater portion of the duties which these public agents are chosen to perform, have really nothing to do with party politics, and moreover, that they are of such a nature as imperatively to require all the wisdom, knowledge, and virtue of the nation to execute them beneficially for the national welfare: a subject, by the way, in regard to which the rank and file of no legislative body, ever yet chosen upon mere party principles, have been any better qualified to act wisely, than to make good grammars for all the dead and living languages of the world. This would be equally true, whether they were *honest* or *dishonest*, since, in both cases, they must unavoidably pin their faith upon the sleeve of others—must be knowingly or unconciously led or driven into the party-track; for they would often have to decide between questions widely differing from each other, questions of great national interest, requiring for their decision much general knowledge and experience; questions moreover, in regard to the comparative merits of which they would be nearly as ignorant as so many children. But thus it goes, in these our days, at all our elections for representatives. "*Hurrah! hurrah!!*" for the most popular idol, at such a time, in any particular county or district, effectually drowns all argument of the adverse par y: because an answer all the better for its brevity, on an occasion so animating—an answer to every suggestion calculated to damp the prevalent party fervor; and often elevates to the dignity of delegate, (I cannot conscientiously say *representative*,) of said county or district, some two legged animal, called *man*, who should thank good luck for it, if he finds his way to the legislative halls of Virginia without a guide. I beg you sir, to be assured that this is no exaggeration, for the gentleman is now living who, if necessary, could prove upon oath, that, at one of the sessions of our legislature when these party battles first began, he had literally to pilot one of these legislative noodles through the simple process of presenting his credentials, and marching into that legislative hall, where he was to make himself a laughing stock during the whole session, by such memorable fooleries, that it is not uncommon to hear them recapitulated, even at this day. But so it has been, and will be forever, while political party spirit is suffered to rule the land; for when the constituents become so distempered, so deeply infected with this moral poison, as to seek nothing else but a similar infection, as the chief, the indispensable qualification in their public servants, it is next to impossible that their representatives should be in a more healthful condition than themselves. They will certainly act and react upon each other so as to perpetuate the infection with increased virulence, until, like those pestilential diseases which destroy the body natural, it inflicts death on the body politic. How indeed, should it be otherwise? For it pervades every man's home, severs the closest friendships, brings diabolical strife into all the private relations of life, immeasurably injures the morals of every community by altering and lowering the standard of fitness for all public trusts, and, limits the field of choice for public functionaries—*not* to the whole number of the party which happens to be dominant at the time—for that might not be so bad, if it composed a very large majority of the nation—but to *that portion of it only*, which, for the honor of human nature, we may hope is comparatively small in every party, who can consent to yield the clearest convictions of their understanding and consciences to party-dictation. In truth, God has never scourged any people, for their sins, with a more dreadful curse than party-spirit: for, in religion it has caused the most bloody, savage, and exterminating wars, while in politics it has produced millions of deeds so atrocious, so horrible, that the bare recital of the least of them is enough to chill the heart's blood of any human being who possesses the smallest spark of humanity. For proof of this, I need go no further back in the history of the civilized world than to that blackest, most shocking of all its pages, the French revolution! A revolution distinguished above all others for its systematic and impious attempts to banish every thing like morals and religion from the face of the earth, by the deliberate murders of millions of the wisest and best citizens of France.

Thoroughly and deeply convinced as I am, that the salvation, not only of Virginia, but of our union itself, depends upon the extinction of the party-spirit which has so long and disastrously prevailed among us, I cannot quit the subject without a few more remarks on the fatal practice of choosing our representatives solely for their political party qualifications. Suffer me then still farther to illustrate that practice and its consequences.

The great principle of popular representation, so admirable in itself, so superior to every other basis of government, if fully and faithfully carried out, becomes, when thus perverted, the most effective, the certain means of its own destruction. The name will be carefully preserved by the unprincipled destroyers, the authors of all the mischief, and the people will be more than ever flattered with the assertion of its being in full and most successful operation, more than even gulled with the vain title of *sovereigns*, while these dear friends of theirs are leading them, like so many sheep, whithersoever they please. The party people themselves having limited their choice of representatives, as I before remarked, to a much less number than the whole of their own party, by making implicit obedience to its leaders the "*si e qua non*" of their votes, rarely, if ever, are represented either by the wisest or most virtuous men, even among themselves. They act as the bark-grinders do, who always prefer blind horses for their work. Being, themselves, regardless of all other interests but those of their own party, they will choose men who are mentally blind to every thing else, in preference to men who can see, feel, and utterly scorn the degradation of such a service. It is true, that the few who are to act as leaders and drivers, must have eyes, and tolerably sharp ones too, in order to steer safely through the

many tortuous defiles which the still higher powers of their party command them to pass. But all that it is necessary for their teams to know, is the voice of their teamsters; to understand how to "gee and haw" at the word of command, or the smack of the whip; and never to balk, however sorely their harness may gall—however deep may be the mud, the filth, and the stench through which they may be goaded, either by words or the lash, to pull.

Were I to count up all the months worse than wasted in this vile party work, for the last thirty-odd years, the whole time, I have no doubt, would have been amply sufficient for five or six entire sessions of our legislature, spent, as they ought to be, in the diligent, earnest, but calm and dignified discussion of the great concerns and interests of the state. But ever to expect so patriotic a course will be utterly vain, unless we can prevail on ourselves to change entirely the standard by which we test the qualifications essential to the wise and faithful discharge of all public duties. We agriculturists are more especially interested in this change than any other class: for it is perfectly demonstrable, that to the want of it must be ascribed much of our present depression—much of that utter neglect of our interest which has marked the legislation of Virginia from my earliest recollection. This neglect, I fear, we are destined to suffer unto death—for fools that we are, suicidal fools! we never *yet* have co-operated as a class; and the chance of our ever doing so hereafter may readily be calculated by any of those who noticed, (if, indeed, *any* have,) the utter failure of the late attempt to get up an agricultural convention. But until we *do co-operate as a class*, I deem it absolutely certain that our relative and legitimate power of contributing to the general welfare, and the extent to which that welfare depends upon our condition, will never be either felt or recognized as a proper subject of consideration by those *miscalled* our representatives. Compared with other classes, we still have the numerical majority, still possess a larger property within the state than any other class, and can still bring to the polls a larger number of voters. What obstacle therefore, but the most asinine stupidity, or destructive neglect of our own best interests, hinders us from exerting over the legislation of the state, *that* influence to which we have such just and indisputable claims—an influence moreover, which could not possibly be exercised in favor of our own occupation, without benefiting every other in the community? Then, why not exert it at once, *by determining unanimously*, to vote for no man, at our spring elections, who will not pledge himself to make some certain and earnest effort in favor of agriculture? Let *this* be done—let us establish *this* as one of our indispensable tests in choosing our representatives, and death itself is not more certain than would be as ample legislative aid as we would ask.

(*To be continued.*)

A NEW SEEDLING VINE.

The *Journal of Science and Art*, vol. xxvii. p. 229., contains the following notice: "A seedling vine, raised by M. Van Mons, at Brussels, produces fruit as large as a green-gage plum, which, at the latest, ripens in the first fortnight of August, and never fails." I should be glad to know if this grape can be procured in England.—*J. B. W., Sept.* 15, 1836.—*Loudon's Gard. Mag.*

POTASH FROM BEET-ROOT.

The beet-root, says a French paper, is about to acquire an additional title to the attention of agriculturists, by the new produce which, besides molasses and sugar, it is now found can be extracted from it. One of these productions, potash, will be, like sugar, the rival of an exotic commodity. M. Dubrunfont has been the first to discover the means of advantageously extracting this substance from the residuum left after the distillation of molasses, and which has hitherto been thrown away, after the separation of its alcohol. To give some idea of the importance of this new source of national wealth, it will be sufficient to say that the quantity of potash yielded by M. Dubrunfont's process is equal to one sixth of the quantity of sugar extracted from the beet-root; thus admitting the the fact that, where 80,000,000 lb. of indigenous sugar are annually produced, we may expect to obtain from the primary materials 14,000,000 lb. of a saline substance, equal in all respects to the best potash imported; besides alcohol and other productions. At the present rate of prices, the value of this quantity will be about eight or nine millions of francs; and these facts furnish an additional argument for the protection of our indigenous sugar against foreign competition. (*Morning Chronicle*, Nov. 1. 1836.) I have since learned that a kind of coffee is made by the French from some part of the beet-root, after the sugar has been extracted, which is said to be equal, if not superior, to coffee from chicory. Now, as there is an establishment at Limehouse for extracting sugar from the beet, I should be greatly obliged to any of your readers who would inform me, 1st, Whether this manufactory answers as far as sugar is concerned? 2dly, Whether potash is extracted from the refuse? 3dly, Whether coffee is made of it? and, 4thly, To what other purpose is the refuse applied? The reason I ask is, that I intend trying to extract sugar from the root on a small scale, for the use of my own family, and for teaching my pupils. I give you my address below for your own use; but wish, if you publish this article, that it should be signed—*A. D. G. Near Stockport, Nov.* 2, 1836.—*Loudon's Gard. Mag.*

From the Genesee Farmer.

HAY FROM SCOTLAND.

An English paper says—"It forms a curious item of the agricultural commerce of this country, that we are now exporting hay to America. A vessel is about to sail with a cargo of 10,000 stone of hay from Aberdeen, and a larger will follow from Clyde. The hay is pressed by the hydraulic press, and the bulk has been thus reduced [sufficiently] for transportation."

The hay thus spoken of has reached this country and finds a quick sale at from 22 to 25 dollars a ton, principally at Boston. If Great Britain, with nearly three times as many horses, cattle and sheep, in proportion to its population, as are owned

in the United States, is not only able to provide for their wants, but furnish large supplies of hay for exportation, it proves that England is far ahead of us in productive farming, and that we ought to mend our agriculture at once. It is the *cultivation of roots*, that enables English farmers to keep so many cattle, and spare us their surplus hay; and American farmers must follow the example, or fail of their profits and their success. It is surprising with what tenacity our farmers cling to old usages; and persist in mowing ten acres of land to get fifteen or twenty tons of hay, when two acres of roots will furnish more and far superior food. There is hardly a crop produced, more certain than the ruta baga, unless attempted on soils decidedly unfavorable, and their excellence has been fully tested for feeding and fattening cattle and sheep; yet not one half our farmers can be induced to attempt the culture of the root. It is satisfactory to know, however, that the root culture is gaining ground; and that those who have tried the turnip, will not readily relinquish its use and benefits.

A "JOIN-BEEF" PAPER.

To the Editor of the Farmers' Register.

Scotland Neck, N. C. 20th Jan. 1837.

Below, you will find what is called in this neighborhood, a "join-beef paper." It has been found very convenient to the farmers in this neighborhood, and will be so to all, where not situated near to a market. As a proof of its convenience, I have now in my possession papers which will show it to have been regularly kept up for the last sixty years in this neighborhood. I have never heard of it in any other place but here. If you think its publication in the Farmer's Register will contribute any thing to the convenience of your readers, you can publish it—otherwise you can destroy it.

A	Loin. 32	Leg.	Brisket.	Rack.	Loin.	Leg.	Brisket.	Rack.
B	Leg. 28	Loin.	Rack.	Brisket.	Leg.	Loin.	Rack.	Brisket.
C	Brisket. 29	Rack.	Loin.	Leg.	Brisket.	Rack.	Loin.	Leg.
D	Rack. 31	Brisket.	Leg.	Loin.	Rack.	Brisket.	Leg.	Loin.
E	Loin. 28	Leg.	Brisket.	Rack.	Loin.	Leg.	Brisket.	Rack.
F	Leg. 29	Loin.	Rack.	Brisket.	Leg.	Loin.	Rack.	Brisket.
G	Brisket. 30	Rack.	Loin.	Leg.	Brisket.	Rack.	Loin.	Leg.
H	Rack. 28	Brisket.	Leg.	Loin.	Rack.	Brisket.	Leg.	Loin.

The first column, A, B, C, &c. represents the "joiners'" names: the second represents A, the first killer of beef, who puts the weights under each piece that he sends to the other joiners. When B kills, he puts the weight in second column, and each joiner follows on in the same way until the join finishes. The join can be once or twice a week. If for once a week, the paper will last eight weeks—if twice a week, only four weeks. In our neighborhood, we join twice a week. The beeves weigh from fifty to sixty, per quarter, as this size is most convenient to most farmers here. If one kills a beef rather small this year, he generally kills a larger next; or if he kills one too large, he kills a smaller one next time. The weights are put down more for the purpose of keeping them from sending to the wrong person than any thing else. By examining the paper you will see that each one returns the same piece sent him by his neighbor.

WM. R. SMITH, senr.

WASHINGTON'S VIEWS OF WAR AND AGRICULTURE.

We find the following sentiments in a letter written to Arthur Young, Esq., of Great Britain,

some years after the war; its date is Mount Vernon, Dec. 4, 1788:

"The more I am acquainted with agricultural affairs, the better I am pleased with them; insomuch that I can no where find so great satisfaction as in those innocent and useful pursuits. In indulging these feelings, I am led to reflect how much more delightful to an undebauched mind, is the task of making improvements on the earth, than all the vain-glory which can be acquired from ravaging it, by the most uninterrupted career of conquests. The design of this observation is only to show how much, as a member of human society, I feel myself obliged by your labors to render respectable and advantageous, an employment which is more congenial to the natural dispositions of mankind than any other."

In another letter, written about the same time, he says:

"How pitiful, in the eye of reason and religion, is that false ambition which desolates the world with fire and sword for the purpose of conquest and fame, compared to the milder virtues of making our neighbors and our fellow-men as happy as their frail conditions and perishable natures will permit them to be."

From the Petersburg Intelligencer.

RALEIGH AND GASTON RAIL ROAD.

It gives us much satisfaction to learn that this work is in rapid progress, and bids fair to be completed with as much despatch as any that has preceded it.

One-half of the whole line of the road, from Gaston to Chalk Level, a distance of about 45 miles had been located and put under contract. Between 600 and 700 hundred hands are at work, and although only five weeks have elapsed since a commencement was made, the extent of excavation and embankment is already considerable.

Exclusive of several contractors who have heretofore been regularly engaged in this occupation, some of the most wealthy and respectable planters residing in that part of the country have taken contracts, and are making excavations and embankments instead of tobacco and cotton—looking forward to the benefit which they will derive in the transportation of future crops to market, when the rail road shall be completed, which will no doubt precede the maturity of their next year's crop. The owners of land, on and near the line of the road, find a new resource in the market which it affords for their timber, heretofore of little or no value—for provisions of all sorts, and for any superfluous labor from the business of farming. Most of the foundations of the piers and abutments for the bridge across Roanoke are above high water mark, and that great work will be speedily executed.

The road has been located as far as Tar River, and will soon be completed to Raleigh. Persons are in readiness to take contracts on this half of the road, and there is no doubt that the entire line will be let, very soon after the requisite preparations are made by the engineers.

A spirit of activity, we understand, prevails along the whole extent of the whole country through which the road is to pass, and all look forward with confidence to the benefits which it will confer.

The legislature of North Carolina has granted a charter for a rail road from Raleigh to the South Carolina line, in the direction to Columbia; and books for subscription to the stock will be opened in the course of a few weeks.

ON THE USE OF THE CULTIVATOR—IMPROVEMENT OF LAND &C.

To the Editor of the Farmers' Register.

White Plains, Norfolk Co., Va.
January 30, 1837.

Inclosed I have remitted the amount of my subscription for the third and fourth volumes of the Register, though I can but "*plead guilty*" for being so tardy in attending to it; yet I hope it will not be the less acceptable, though at a "*late hour.*" And by the by, as snow has driven me "*in doors,*" and there is much blank paper to spare, I will say a word or two about our farmers and farming generally in this county, though I shall despair of saying much in their favor.

I can but congratulate you on the general good that has resulted from reading your paper, and had hopes that it might be found on every planter's chimney-piece in the county; but alas! emigration is here raging with all the strength of fanaticism, and nothing else can be talked of but selling estates, at a great sacrifice, and "*packing off*" for the "*far west.*" This of course has banished all agricultural books, tracts, periodicals and the like from their libraries, and they dream of nothing, day or night but "Aladdin's magic lamp of Arabian story," or some such thing, that, by a look or a wish, will coin every thing into gold. So infectious, indeed, has the mania become, that no astonishment is produced on seeing our wealthiest neighbors leave, and plunge into the "adventurous ocean" of emigration. Not content with doing well, when such "golden visions" of full pockets and "groaning coffers," haunt the midnight pillow, by reaching forth to pluck, they "unmoor their anchor" and launch away in bright expectation of doing better, like the man who killed his goose that laid a golden egg every day. But whether these bright visions be correct or not, is it not a pity that the industry and wealth, the very "bone and sinew" of our venerable old commonwealth should thus be leaving it? It seems to me almost unfilial and unpatriotic, after having drained from her veins almost the last drop of blood, in the moment of destitution and need, when her pensive and tottering pace calls loudly apon all her sons for support; for none can deny but that party feeling, "like a canker worm in the bud," is paralyzing all her resources, and kicking her down hill, as fast as a retrograde motion will allow her to travel. But in this, as well as every thing else, the old adage is verified, "what is every body's business, is no body's," and instead of calling her legal guardians to an account for her condition, truant like, we run away, and leave her to be the "whip-top of fortune," to be whipt round and round by every "do-nothing body" that can lay hands on the lash. But I'll turn to the plough, as I understand better what to do with it than with the reins of government.

Agriculture in this county is slowly advancing, the "scales of ignorance" have fallen from many

of our eyes, and we begin to doubt whether the "old beaten track" is best. The cultivator is becoming more in use among us, in lieu of the plough, and we think it a valuable improvement in our husbandry, as our corn crop can be tilled with less than one-half the labor. By the by, I 'll give you the result of an experiment, made the last season, to ascertain the difference between the plough and cultivator, in the cultivation of corn. Though the experiment was not in every respect a fair one, for the measuring tub was not used, yet it was sufficiently so to satisfy all who saw the standing crop, that nothing was lost by the use of the cultivator. Two lots of land were selected, of nearly equal fertility, (the difference, if there was any, was in favor of the cultivator,) and planted at the usual time, and both received the same number of workings over, with the plough and cultivator, also the same number of hand-hoeings. The season was certainly a bad one for the cultivator, for with it the surface is always kept level, and notwithstanding the heavy inundating rains, the lot on which the cultivator was used, produced one-third the most; but the difference in product I am willing to credit to the superior fertility of the land, rather than to the cultivator. As a labor-saving implement, there should not be two opinions, for the work of one corn-row may be done by twice running, or two 'bouts, while the plough requires four, if not five, 'bouts; thus it is one half the labor, at least, is saved, and if the work is well done, and adapted to the growing crop, a great object is accomplished in the cultivation of the most useful of all grains, to wit, Indian corn.

By the way, I had like to forgot my *experiment crop* for last year, that I think will say much for the cultivator. The lot on which it was made, contained six acres, enriched principally by clover, lime, and plaster, one acre of which was "bottom land," originally fertile, but the heavy inundating rains compelled me to abandon it, when but five acres were left. The corn was planted in drills on a level surface, in rows five feet apart, and as thick as it could well grow, say from 12 to 18 inches. When the corn came up, the new-ground coulter was used by running as near as possible, and as deep as one horse could pull it. The remainder of the work was done with the cultivator, except three hand-hoeings which was given it—the quantity gathered was ninety barrels. This experiment was made with a two-fold object, first to ascertain the "speed" of the land, and secondly to convince some of my incredulous neighbors, that land here can be made to produce as much, of any crop that the climate is adapted to, as the lands of the "far west;" and that we have only to set to work, the right way, to improve it.

My mode of improving land, I think, differs from the majority of my agricultural brethren; nor do I pretend to say that it is better—only that it is the most convenient, and offers a surer guarantee for a certain remuneration, with the least labor. My manor farm consists of about four hundred acres of arable land. A division fence makes two fields of two hundred acres each. One of these fields is cultivated in corn in alternate rotation, whilst the other is suffered to lie out, without the taxation of either tooth or hoof. My manure annually, which generally amounts to from one to two thousand good cart loads, is generally applied to from 12 to 18 acres of land, spread on the surface after fallowing, and made rich at once, and then set in corn, to prepare the soil for clover. After clover, with any thing like "fair play," the land will continue to progress in improvement. By this system, in fifteen years, should my quantity of manure not increase, I shall be enabled to manure the four hundred acres over, at the rate of one hundred cart loads per acre, and my crops increase annually, having already about fifty acres completed.

Our crops, the last season, both of corn and oats, in this and the adjoining county, Princess Anne, were unusually heavy, and we only need "active hands," and "understanding hearts" to do nearly as well as we deserve. True, we have to work hard for all we make; but where is the land or country where the farmer is not compelled to live "by the sweat of his brow?" If our state, or its legislature, would but show our profession "fair play," protect our property and our rights, and thereby prove to us that we were recognized and honored as a profession, as one of the principal pillars of the country's prosperity, by hearkening to our petitions, and honoring our representatives—then no "sod" on earth would be as fondly loved, as that of the old dominion. I do not, Mr. Editor, often complain, for well I know complaints are often ill-timed; but in this case every farmer should "cry aloud and spare not,"—should thunder forth their wrongs and grievances, "with the voice of a trumpet," nor cease till a hearing was granted us. If, indeed, it would oppress any, by doing us justice, then would we be silent; but when no profession will be harmed, but rather, all be benefited, and the vital interest of the state improved, it seems to me to be the most reasonable request that could be made—yea farther, our duty to make it, and their imperious duty to attend to it. But here I owe an apology to my friends for not meeting them at the last agricultural convention: however offering a legal excuse, "having married a wife," I hope for pardon. Notwithstanding, so delicious as is the "honey moon," I should have attended, but for the obstruction of the river by ice so as to prevent navigation. But had I attended, so imbecile would have been any aid I could have afforded, that I am sure my seat in the chimney corner, at home, was filled with better grace than it could have been in your convention.

AG. S. FOREMAN.

FLORIDA COFFEE—POTATOES.

To the Editor of the Farmers' Register.

Fayetteville, N. C., February 14, 1837.

* * * * *

I promised in a former communication to let you know the result of my experiment with Florida coffee. The imposition practised upon the public, recommending that offensive weed, was too great to be referred to in good temper. Suffice it to say, that the loss of the $2, paid for the pound of seed, the use of an acre of land, and the expense of cultivation, were not so mortifying to my pride, as being made the dupe of a knave.

Do not omit sending me the missing numbers of the Register: although no farmer, I have derived too much pleasure and information from that valuable publication to lose any part of it.

I have cultivated sweet and Irish potatoes for many years, but I am candid in saying, that the information I have obtained from reading the Register has enabled me to double my small crops of these articles.

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STRAWBERRY CULTURE. DISTANCE OF CORN —EXPERIMENTS WITH MARL AND GYPSUM.

To the Editor of the Farmers' Register.

Powhatan Hill, 10th Feb., 1837.

The last No. of the Register, just received, suggests some reflections upon which you may place any or no value, as you please. In the first place, it is recommended in an article extracted from the Village Record, on the cultivation of strawberries, to mow the vines and cover the bed with rotten wood. I have pursued a different course with mine for several years, and experience recommends my practice. My beds are weeded once a year only—in the fall—the plants are at that time thinned to the usual planting distance: after the beds are cleaned thoroughly, they are covered with either cut straw or chaff—the first is best, as the chaff generally contains seeds of wheat, cheat or weeds. The plants are thus kept warm through the winter—they spring up through the straw early in the spring with great vigor. When the fruit ripens, the straw protects it from the dirt—it smothers weeds; and by its decay before the autumn, it furnishes sufficient manure to enrich the beds. This is the mode of culture practised by a gentleman living near Baltimore, who supplies that market with many thousand quarts during the delicious strawberry season.

In the second place, I desire to recommend "Six and Two" to plant his corn, if he prefers the drill system, (in which preference my opinion coincides with his,) five feet by two in good land—five feet by two and a half, or by three, in thin land. That writer prefers six feet by two, because, "the greater the distance one way, the less your corn will be ridged by ploughing; and, therefore, the more dirt you can throw immediately around it without injury." I prevent my five feet beds from being ridged too high by running upon the beds, soon after the corn comes up, a large two-horse harrow, which I term a *cultivator-harrow*, the horses walking on each side of the corn, which passes between the two foremost teeth.* The hindmost part of the harrow is five feet wide, and consequently reaches the water furrow on each side of the bed. The ridge is thus drawn down to a sufficient level: the corn is worked so well, that an observer would presume that it had been weeded—the hoe work is, therefore, facilitated greatly, and the corn worked more rapidly than it would have been in the usual mode. Unless the land is very stiff, there is no necessity for *siding* the corn with the plough in the first instance. After the corn is too high for the *cultivator-harrow* to pass over it, the land is easily kept clean, and the corn sufficiently worked by the common cultivator or harrow. At the usual time of *laying by*, as it is termed, you may "throw as much dirt as you please around it;" but not "without injury," if we adopt the opinion of the most judicious northern farmers, who contend that the dirt ought never to be thrown around the corn, the growth of which is thus checked until the new roots put out and grow in the fresh soil. I am disposed to adopt this opinion, and shall try the practice with a portion of my coming crop. My experience, limited it is true, favors the *level* system of cultivating corn; but I have not yet given it so full and satisfactory a trial as to venture to recommend it. I do not flatter myself that I have assigned sufficient reason to change the views of "Six and Two." I am convinced by trial, that 5 by 2 is not too close in strong land: there are more stalks, of course, than in beds of 6 by 2; 6 by 2 is too close in thin land; 5 by 3 would bear the same number of stalks as 6 by 2 1-2: beds six feet wide require one furrow more, at the least, with the plough, in breaking up the land: the corn, when well grown, does not shade the land, and consequently preserve the moisture so well in wide as in narrow beds.

I will now mention an experiment made by me last year. I planted a part of a cut of corn about 5 feet by 2, single stalk, and another part of the same cut 5 feet by 3, double stalk. Several gentlemen, whose attention I directed to the trial during the summer, did not hesitate to express the opinion, that the single corn would produce the most. When the corn was hauled from the field, I had the product measured by the cart bodies, and there was no sensible difference in the yield. The number of ears from the latter, was, of course, greater; but they were much smaller—more trouble was imposed in gathering and shucking; consequently, the advantage was on the side of the single stalk, which was somewhat diminished, however, by the necessity of weeding a larger number of hills.

I hauled some marl on my corn land last winter. I put some on a very poor spot, without any putrescent manure: the corn was improved by it most sensibly—so much so, that the negroes, on cutting the corn to sow the land in wheat, stopped of their own accord, (and you know, they are the least observant of the human species,) at the row where the marl stopped. I want no better proof of its efficacy, and am using it freely, and shall do so as long as I am a farmer.

I have imposed more on your patience than I intended; but before I close, permit me to recommend some of your experimenting readers to try the efficacy of plaster of Paris upon the Irish potato. Sprinkle the cuts heavily with it before the dirt is drawn over them. I think that I owe a large increase of my crop for two years to the plaster.

ED. T. TAYLOE.

* A little boy follows the cultivator-harrow with a small rake to remove the clods which may cover some of the corn.

From the Silk Culturist.

THE NATIVE, OR COMMON RED MULBERRY AS FOOD FOR SILKWORMS.

Lancaster, Ohio, Dec. 7th, 1836.

F. G. Comstock, Esq.

Sir:—Having learned from the "Culturist" and other authorities, that seven or eight pounds of cocoons are usually required to produce a pound of reeled silk, I can hardly hope to be credited when I state the result of an experiment or two

that I lately made with a few cocoons of worms that were fed on leaves of the *morus rubra*,* or common red mulberry of our western forests.

The cocoons were deprived of their loose floss, and the crysalids were perfectly dry. I weighed cocoons to the amount of 215 grains, and causing them to be reeled I obtained 75 grains of silk, equivalent, very nearly to 35 per cent. Observing that several grains were lost through unskilful management, the reeler being altogether inexperienced in the business, I determined to repeat the experiment, in order to ascertain, if possible, the maximum of silk that could be reeled from a given quantity of cocoons. I then carefully weighed just 100 grains of the cocoons, which yielded 39 grains of reeled silk, besides a few atoms of floss amounting perhaps to one grain. It would thus appear that these cocoons contained about 40 per cent. of silk. What is the per centum of silk usually contained in dry cocoons? and what proportion of the silk contained by the cocoons is extracted in the ordinary process of reeling?

In determining the value of the red mulberry, as a source of food for the silk worm, we should inquire—

1st. What is the quality of the silk it produces?

2ndly. Is the red American mulberry, a tree of as rapid growth as the white Italian, with which we would naturally compare it?

3rdly. Does the former produce as abundant a foliage as the latter?

4thly. Is the foliage of the American tree as nutritious as that of the Italian—and do worms fed upon the former produce as good cocoons as those fed upon the latter?

1. With regard to the quality of the silk obtained in my experiments, I do not profess to be a competent judge; but I certainly cannot conceive that any thing of the silk kind could excel it in fineness and brilliancy. My judgment, however, is not needed to establish the character of the silk produced from the American mulberry. We are already in possession of an overwhelming mass of evidence tending to prove most decisively, that this silk will bear comparison with the *best* that can be produced from any other source. Your readers may find some of this evidence in articles on the 92d, 94th, 96th, 105th, 109th, 138th, 155th and 156th pages of the "Silk Culturist," and also in a document published by Congress in 1828, and containing "information in relation to the growth and manufacture of silk."

In addition to these testimonials, I would present the evidence of Mr. D'Homergue, a French silk manufacturer, who pronounced a sample of reeled silk which had been produced from the red mulberry to be "indeed beautiful"—"not surpassed by any that he had ever seen," and "equal in firmness to any other."

I could also demonstrate by citing several authorities, that sewing silk produced from our native mulberry is *stronger* than the European article.

2. With regard to the second query I would premise that it is hardly fair to compare a plant in a state of nature with one that has enjoyed the advantages of cultivation. Notwithstanding, however, the disadvantage that exists on the side of the American mulberry, it has the appearance of being the more thrifty tree, if I might be permitted to judge from a few specimens that I have seen of the Italian tree.

3. If there is any difference in regard to the quantity of foliage yielded by each, I believe that the difference is in favor of the American tree. At least it is certain that the red mulberry has the important advantage of producing a much larger leaf than the other.

4. That the leaves of the American mulberry are as nutritious as those of the Italian, and that a given quantity of the former will produce as much silk as the same quantity of the latter, there can be no doubt. And all observers concur in remarking that the cocoons preduced from each are equally fine. Mr. Jesse Waltz of this place informed me that he and his neighbor, Gen. P. Beecher, each fed a few silk worms in the same season, Mr. Waltz using the common wild mulberry, while Gen. Beecher used the Italian; and that upon comparing the cocoons, there was not the least perceptible difference. The cocoons were reeled, and upon a second comparison no difference in the quality of the silk could be discovered.

I would now inquire, why in the name of common sense, persons in the west who wish to engage in the silk culture should wait on the tardy growth of the Italian mulberry from the seed, when the forests every where around them abound with a tree altogether equal, if not superior to it. In almost every neighborhood a considerable cocoonery might be profitably supplied from trees planted by the hand of nature. But as these trees are generally somewhat dispersed, and as the climbing of large trees is inconvenient, I would recommend the plan of propagating the red mulberry by means of cuttings set hedgewise. By stocking the requisite quantity of ground with thrifty cuttings, a person might, on the second year, have any amount of foliage that he might desire.

One of your correspondents estimates that an acre of ground set with cuttings of the Chinese mulberry will on the first year yield 10,000 pounds of leaves. It is allowed by some writers that 100 pounds of foliage will produce one pound of silk. If this supposition is correct, then the produce of one acre on the first year would be 100 pounds of silk, worth, when reeled, $500. I feel confident that on the second year a result equal to this might be obtained from our native mulberry. I am not sure that the foliage might not be profitably used even on the first year.

Permit me to suggest a theory in regard to the Chinese mulberry. I am persuaded that it is a creature of cultivation. It is propagated altogether by layers and cuttings, instead of seed; and the stems are cut down every year to the ground in order to obtain an annual crop of fresh shoots. It is to these circumstances of its propagation and culture that the luxuriance of its growth, and the largeness and tenderness of its leaves, are owing. Hence will appear the reason why a similar plant is not obtained when attempts are made to propagate it from the seed. The plant obtained from the seed is a ***natural*** production; while that produced by other means is an artificial

* This is the true botanical appellation. Some have improperly called it *Morus nigra*, or black mulberry. The black mulberry is not a native of North America.

one.* I believe that I can originate a new kind of *morus multicaulis* quite as good as the old, from the red mulberry. I design to make the experiment next summer. For a commencement, I can obtain from trees from which some of the larger branches had been accidentally broken off, a considerable number of shoots five and a half feet in length, the growth of last summer—and I can also get a few sprouts of a similar growth and age with the roots attached.

Yours respectfully,

JOHN WILLIAMS.

COMMERCIAL REPORT.

Less business than usual has been transacted in Virginia during the present winter. Supplies of produce were small—foreign markets unfavorable—the results of previous transactions generally losing—and withal, money scarce.

The community is still kept in suspense as to the increase of banking capital within this commonwealth; while the influx of bank notes from adjoining states now furnishes a considerable portion of the circulating medium in some parts of the country, and a depreciated one in others. We thus endure the evils, without deriving the benefits attendant on such institutions, and offer inducements to our neighbors to carry to excess, what we refuse to ourselves in moderation.

The quotations of produce have not varied much since the commencement of the year. The general range of prices is, for tobacco $3 to $7; cotton, 13 to 16c.; wheat, $1 75 to $2 15; flour, $10½ to $12; corn, $4 50 to $4 75. Importations of foreign grain into our northern ports continue to be large and profitable. Flax seed has arrived from India. Charleston is receiving supplies of hay from France, and among the commodities recently imported from that country, sugar (not of the beet,) may be enumerated. This, however, is not more strange than the importation into James river, of coal from Great Britain and Nova Scotia.

British ship owners carry on a thriving trade from our ports in timber and other bulky articles, which acquire the character of colonial produce by a slight deviation from a direct voyage, and are admitted into Great Britain free of duty; while similar importations by American vessels are virtually prohibited. The effect of this system requires no illustration.

The pressure for money which has so long prevailed in our large cities, continues with little abatement. Severe as this has been in N. York and Philadelphia, it is a remarkable fact, and highly creditable to the mercantile community, that scarcely any failures have taken place in those cities. The excessive rate of 1 1-2 per cent per month interest is still current. Real estate has not there declined in price, and all articles of subsistence are high. A recent attempt in New York to reduce the price, by diminishing the quantity, did not succeed; and it is to be hoped that the mob will not repeat the experiment.

In Mobile, the factors, or commission merchants for the sale of cotton for the planters, have suffered great inconvenience, and in many instances been ruined by coming under advances for crops, the receipt of which was, in the first instance, retarded by low water, and subsequently by the want of confidence created by failures among the merchants to which this very delay gave rise. Enormous speculations in real estate probably contributed to produce similar disasters. The effect of heavy investments made by planters in lands and negroes at high prices, on long credit, will probably be developed when the price of cotton shall decline; which, from present appearances, is not a remote contingency. Such a reverse in the prosperity of that country, however, cannot be of long duration, when the increasing population and productiveness of the western states is considered. Internal exchanges continue unregulated, but the rates are not so excessive as they were. The current of specie continues to and fro, benefiting those only who are employed in its transportation.

February 24. X.

MORUS MULTICAULIS NOT PRODUCED FROM ITS OWN SEEDS.

The following statement agrees with what we were first to inform our countrymen of, in this journal, more than two years ago, on the authority of an experiment reported in the *Annales de l'Agriculture Francaise*, that the *morus multicaulis* had been found to be merely a variety of white mulberry, and did not reproduce its own kind by seeds. This very important fact (if true) we have again and again endeavored to impress on the agricultural public—but apparently to no puopose. The anxiety to obtain seeds of the *morus multicaulis* has been so great, that encouragement has been thereby afforded to extensive frauds, by the seller substituting seeds of another kind. But even if the seeds had been what they were supposed to be, if from trees of the true *multicaulis*, the failure and disappointment would probably have been as great.

But though believing that the seeds of this plant are not be relied on for reproducing their own kind, we are not inclined in any case to trust to reported opinions, or authority that is the least doubful, when the facts can be tested by accurate experiment. We have the means of making such an experiment, in seeds of the *morus multicaulis* taken last summer from trees which grew within the enclosure of the high walls which surround the Penitentiary of Virginia, and near which no other kind of mulberry grew, to affect the seeds by a mixture of the fecundating farina. If *these seeds* will not produce the *morus multicaulis*, it may be thereafter safely pronounced, that seeds are not only not to be relied on to produce this kind, but that the result of reproduction of the like kind rarely, if ever, occurs.

"This mulberry, it is now well ascertained, is a hybrid variety, and not a true species—the seed will not produce its like. We have been informed by a gentleman who purchased a plant, three or four years since, of some nurserymen of our vicinity, that with considerable care he raised quite a number of seeds. The plant was taken up upon the appearance of severe weather, and placed in a celler where the frost did not penetrate—the roots were slightly covered with earth. Pursuing this course two succeeding winters, it attained the size of a large shrub with numerous ramifying branches—the third season it produced seeds. No

* If seed from the artificial tree be used, the plant re-appears in its original form.

other species or variety grew in the vicinity of the plant, and the blossoms consequently could not have been fertilized but by its own pollen. These seeds were carefully sown, and the result was a number of seedling plants, with foliage of all sizes and textures, from the common white, to that of the parent. No better proof is needed to confirm what we now state, and have heretofore stated."—*American Gardener's Magazine.*

THE INDEX TO VOL. IV.

It has heretofore been our course not to delay the last No. of a volume for the issue of the index, (which must necessarily be completed and printed after the close of the volume,) but to send the index to every subscriber with the next No. But so many of these loose sheets have been lost, either after or before their being delivered from the post-offices, and so numerous and long continued have been the consequent demand for duplicates, and even sometimes triplicates copies, that, in self-defence, another plan of issuing must be adopted. For this purpose, the next and last No. of vol. 4, will be delayed (if necessary,) after the first of April, the day when it should in due course be issued, until the index for vol. 4 can be printed and stitched with it. Then the one cannot fail, without the other, to reach every subscriber.

It is believed that almost every subscriber to the Register *intends* to have his numbers bound in volumes, and attempts to preserve them for that purpose. But so little care is generally used in preservation, and so much delay permitted before the binding, that the very desire to preserve, serves to destroy for us numerous volumes, by applications for lost or mislaid numbers—which applications we have never refused, if the copies asked for were on hand—and they have been always furnished gratuitously, unless in some few cases where a single applicant asked for half a volume or more. It would save much loss to all parties, if all subscribers who wish to preserve their numbers complete, would not delay the binding much beyond the completion of each volume. If this had been done from the begining, we should not now be unable to buy back copies of vol. 1 at the higher price, which is offered, ($6,) than the subscribers paid for them. And on the other hand, if none had cared or desired to preserve their files perfect, we should not have had destroyed, and lost the value of some hundreds of volumes in the course of four years' publication, by the demand for duplicates of lost and mislaid numbers.

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